10-3930-238-20

TM 10-3930-238-20

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL

TRUCK, LIFT, FORK,

GASOLINE
PNEUMATIC-TIRED WHEELS
6,000 POUND CAPACITY
ARMY MODEL MHE-193
BAKER MODEL FJF-060
FSN 3930-738-5938

HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1964

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READEX FICHE best copy available

SAFETY PRECAUTIONS

BEFORE OPERATION

When servicing battery, do not smoke or use flame in the vicinity. Batteries generate hydrogen, a highly explosive gas.

Check to be sure there is sufficient engine coolant and engine lubricant before starting the engine.

Do not fill fuel tank while engine is running. Provide metallic contact between the fuel container and fuel tank to prevent a static spark from igniting the fuel.

Do not remove the radiator cap from an overheated radiator; stop engine and allow radiator to cool before removing cap to avoid injury by scalding. Allow the engine to cool before filling the radiator, otherwise there is danger of cracking the cylinder head or block.

Check equipment logbook for record of proper servicing and maintenance.

DURING OPERATION

Do not shift directional shift lever while truck is in motion.

Be alert for other workers to be sure they are not in the way of the load or the moving truck.

Be sure there is sufficient clearance overhead and on each side of the truck.

Always travel with the mast tilted back and with forks raised just high enough to clear any uneven floor conditions.

Avoid sudden starting and stopping of the truck. Reduce speed when making a turn.

Face in the direction of travel.

Know the rated capacity of the truck and do not overload it. Never pick up a load until certain it can be carried safely.

Make sure the load is steady before lifting it and keep the load against the carriage backrest.

When transporting bulky loads, travel in reverse. Always descend ramps in reverse when carrying a load.

When unloading a heavy elevated load, position the load directly over the unloading spot, as low as possible, before tilting the mast forward.

Be very careful when high-tiering.

Do not butt loads with the forks or with the rear of the truck.

Report any evidence of faulty truck performance.

AFTER OPERATION

Make sure forks are lowered to the ground and hand brake is engaged firmly.

If engine cooling system or any lubricating oil sump is drained, make certain appropriate warning tags are attached to the steering handwheel.

If truck is parked on an incline, block at least two wheels in the event of handbrake failure.

TECHNICAL MANUAL
No. 10–3930–238–20

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *30 September 1964*

ORGANIZATIONAL MAINTENANCE MANUAL

TRUCK, LIFT, FORK, GASOLINE, PNEUMATIC-TIRED WHEELS
6,000 POUND CAPACITY
BAKER MODEL FJF–060, ARMY MODEL MHE–193
FSN 3930–738–5938

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

These instructions are published for the use of personnel responsible for the organizational (second-echelon) maintenance of the Truck, Lift, Fork, Gasoline, Pneumatic-Tired Wheels, 6,000 Pound Capacity Baker Model FJF–060, Army Model MHE–193, Federal Stock Number 3930–738–5938, procured under Contract Number DSA–4–014864.

2. Appendixes

Appendix I is a list of current references. Appendix II is the maintenance allocation chart. The repair parts and the special tools list authorized for use at second echelon is published in TM 10–3930–238–20P.

3. Maintenance Forms and Records

The maintenance forms, records, and reports to be used in the second-echelon maintenance of this truck are listed and described in TM 38–750.

4. Reporting of Equipment Manual Improvements

The direct reporting by the individual user, of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended changes to DA publications) will be used for reporting these improvements. This form will be completed in triplicate using pencil, pen, or typewriter. The original and one copy will be forwarded direct to the Commanding Officer, U. S. Army Mobility Equipment Center, ATTN: SMOME–MM, P.O. Drawer 58, St. Louis, Missouri 63166. One information copy will be provided to the individual's immediate supervisor (e.g., officer, noncommissioned officer, supervisor, etc.).

5. Orientation

Throughout this manual, the use of the terms *right, left, front,* and *rear* indicates directions from the viewpoint of the operator sitting in the seat of the truck.

Section II. DESCRIPTION AND DATA

6. Description

a. Refer to TM 10–3930–238–10 for a general description of the truck.

b. Additional descriptive material will be found in sections of this manual that pertain to a particular assembly.

7. Tabulated Data

a. Capacities.

Cooling system	12 qts
Engine crankcase	5 qts
Oil filter	1 qt
Fuel tank	10 gals
Hydraulic system (approximately)	9½ gals
Transmission and torque converter	10 qts
Drive axle	11 pts (at change) 13 pts (on new axle)

b. Torques. Unless otherwise indicated, all cap screws, nuts, and bolts should be torqued as follows:

¼ inch	8 to 10 ft lb
5/16 inch	15 to 18 ft lb
⅜ inch	30 to 35 ft lb
7/16 inch	50 to 55 ft lb
½ inch	75 to 85 ft lb
9/16 inch	115 to 125 ft lb
⅝ inch	155 to 170 ft lb
¾ inch	270 to 300 ft lb

c. Engine.

Make	Hercules
Model	QXLD–3ER
Type	L-head

Max net cont horsepower	43.6 @ 1800 rpm
Piston stroke	4¼ in.
Bore	3⅞₁₆ in.
Piston displacement	236.7 cu in.
Number of cylinders	6
Compression ratio	6.5 to 1
Torque	190 ft lbs @ 1400 rpm
Firing order	1–5–3–6–2–4
Governed speed w/o load	2400 rpm
Spark plug gap	0.025 in.
Valve lash adjustment	
Intake	0.007 in.
Exhaust	0.010 in.

d. Hydraulic System Pressures.

Lift and tilt	1,650 psi at 2,600 rpm
Steering	1,000 psi at 2,600 rpm

e. Electrical System.

Voltage (nominal)	12
Charging system	Delco Remy
Generator number	1102221
Generator regulator number	1119274
Type	Circuit A
Rating (nominal)	20 Amperes
Cutout relay closing voltage	11.8 to 13.5
Voltage regulator setting (volts)	
at 65° F	14.4 to 15.4
at 105° F	14.0 to 14.9
at 145° F	13.5 to 14.3
Current regulator setting (amperes)	
at 65° F	20.0 to 24.0
at 105° F	18.5 to 22.0
at 145° F	16.5 to 19.5
Distributor (Delco Remy)	1111870
Contact point gap	0.022 in.
Spark Plugs (Champion)	XJ–12
Installation torque	25 to 30 ft lbs

CHAPTER 2

SERVICE UPON RECEIPT OF TRUCK

8. General

When either a new or used truck is received by an organization, it must be serviced as described in paragraphs 9 and 10 to prepare it for operation. These services will be performed by second-echelon maintenance personnel.

9. Removal of Preservatives

a. Remove tape, paper, or other packing. Use extreme care when unpacking and installing separately packaged components.

b. Remove with SD (Solvent, drycleaning), the preservative compound which has been sprayed on exposed metal surfaces. Because this compound is not a lubricant, take special care to see that it is completely removed from all wearing surfaces.

c. If any component or system contains preservative oil, drain the oil from it. Fill with proper lubricant as indicated in lubrication order (figs. 1 and 2).

d. When necessary, fill the battery with electrolyte and prepare the battery for service.

10. Maintenance Inspection and Tests

a. The organization mechanic will perform the services and tests that are listed and described in figure 3. The services performed at this time will begin the cycle of regularly scheduled preventive maintenance services.

b. The deficiencies and shortcomings noted, and the corrective action taken will be reported on the appropriate forms prescribed and explained in TM 38–750.

LUBRICATION ORDER

LO 10-3930-238-20

2 SEPTEMBER 1964

TRUCK LIFT, FORK, GASOLINE, PNEUMATIC-TIRED WHEELS, 6,000-POUND CAPACITY (BAKER MODEL FJF-060, ARMY MODEL MHE193) FSN 3930-738-5938

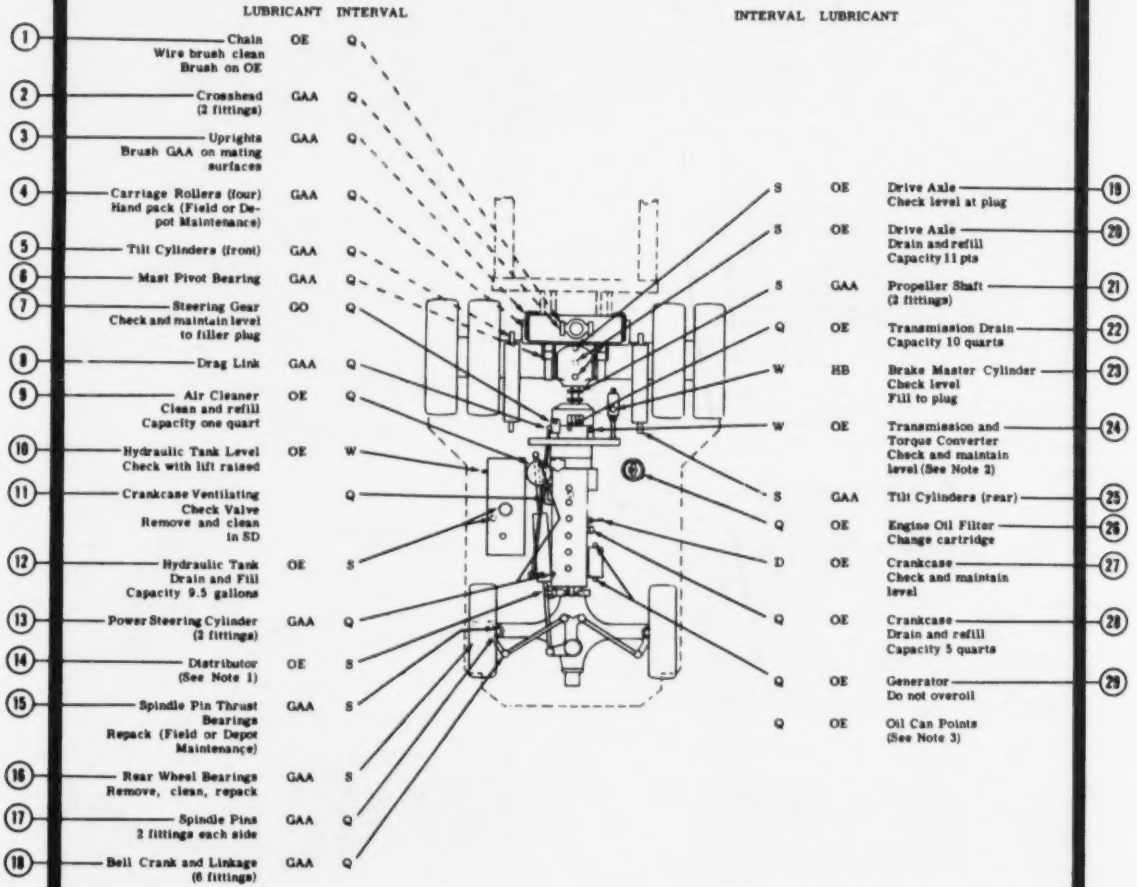
Intervals given are maximums for normal 8-hour operation. For abnormal conditions or activities, shorten intervals. During prolonged periods of inoperation, extend intervals a length of time commensurate with that required to preserve equipment adequately.

Clean fittings before lubricating.

Clean parts with SD (Solvent, drycleaning) and dry them before lubricating them.

Broken arrow shafts indicate lubrication points on both sides of the truck.

Drain crankcase and gearcases only when hot as a result of operation. Clean magnetic drain plugs before installing them.


LUBRICANT
INTERVAL
1 Chain — Wire brush clean, Brush on OE — OE — Q
2 Crosshead (2 fittings) — GAA — Q
3 Uprights — Brush GAA on mating surfaces — GAA — Q
4 Carriage Rollers (four) — Hand pack (Field or Depot Maintenance) — GAA — Q
5 Tilt Cylinders (front) — GAA — Q
6 Mast Pivot Bearing — GAA — Q
7 Steering Gear — Check and maintain level to filler plug — GO — Q
8 Drag Link — GAA — Q
9 Air Cleaner — Clean and refill, Capacity one quart — OE — Q
10 Hydraulic Tank Level — Check with lift raised — OE — W
11 Crankcase Ventilating Check Valve — Remove and clean in SD — Q
12 Hydraulic Tank — Drain and Fill, Capacity 9.5 gallons — OE — S
13 Power Steering Cylinder (2 fittings) — GAA — Q
14 Distributor (See Note 1) — OE — S
15 Spindle Pin Thrust Bearings — Repack (Field or Depot Maintenance) — GAA — S
16 Rear Wheel Bearings — Remove, clean, repack — GAA — S
17 Spindle Pins — 2 fittings each side — GAA — Q
18 Bell Crank and Linkage (6 fittings) — GAA — Q
INTERVAL
LUBRICANT
19 S OE Drive Axle — Check level at plug
20 S OE Drive Axle — Drain and refill, Capacity 11 pts
21 S GAA Propeller Shaft (2 fittings)
22 Q OE Transmission Drain — Capacity 10 quarts
23 W HB Brake Master Cylinder — Check level, Fill to plug
24 W OE Transmission and Torque Converter — Check and maintain level (See Note 2)
25 S GAA Tilt Cylinders (rear)
26 Q OE Engine Oil Filter — Change cartridge
27 D OE Crankcase — Check and maintain level
28 Q OE Crankcase — Drain and refill, Capacity 5 quarts
29 Q OE Generator — Do not overoil
Q OE Oil Can Points (See Note 3)

MSC 3930-238-20/1 (1)

Figure 1. Lubrication order.

–KEYS AND NOTES–

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	above +32°F.	+40° to −10°F.	0° to −65°F.	
OE–LUBRICATING OIL, Internal Combustion Engine	OE-30	OE-10	OES	D–Daily W–Weekly Q–Every 3 months or 250 operating hours, whichever occurs first S–Every 6 months or every 250 operating hours, whichever occurs first
Lift Chains and Distributor Oil Reservoir	OE-10	OE-10	OE-10	
Transmission and Hydraulic System	OE-10	OE-10	OES	
HB–HYDRAULIC FLUID, Nonpetroleum	HB	HB	HBA	
GAA–GREASE, Automotive and Artillery			All Temperatures	
OES–LUBRICATING OIL, Internal Combustion Engine				
HBA–HYDRAULIC FLUID, Nonpetroleum Base, Automotive				

1. DISTRIBUTOR–S, remove rotor and apply OE sparingly to felt wick in center of cam. Do not overoil. Keep oil from contact points.

2. TRANSMISSION AND TORQUE CONVERTER–W, check level with oil warm and engine idling. S, drain and refill with seasonal OE.

3. OILCAN POINTS–Q, apply OE to linkages, bellcranks and other friction points not equipped with pressure fittings or oil cups. Do not apply or permit OE to contact rubber parts, such as grommets, bushings, tires, insulation.

A copy of this lubrication order will remain with the equipment at all times; instructions contained herein are mandatory.

BY ORDER OF
SECRETARY OF THE ARMY:

EARL G. WHEELER
General, United States Army,
Chief of Staff

OFFICIAL:

J. C. LAMBERT
Major General, United States Army,
The Adjutant General

MSC 3930-238-20/1 (2)

Figure 1—continued.

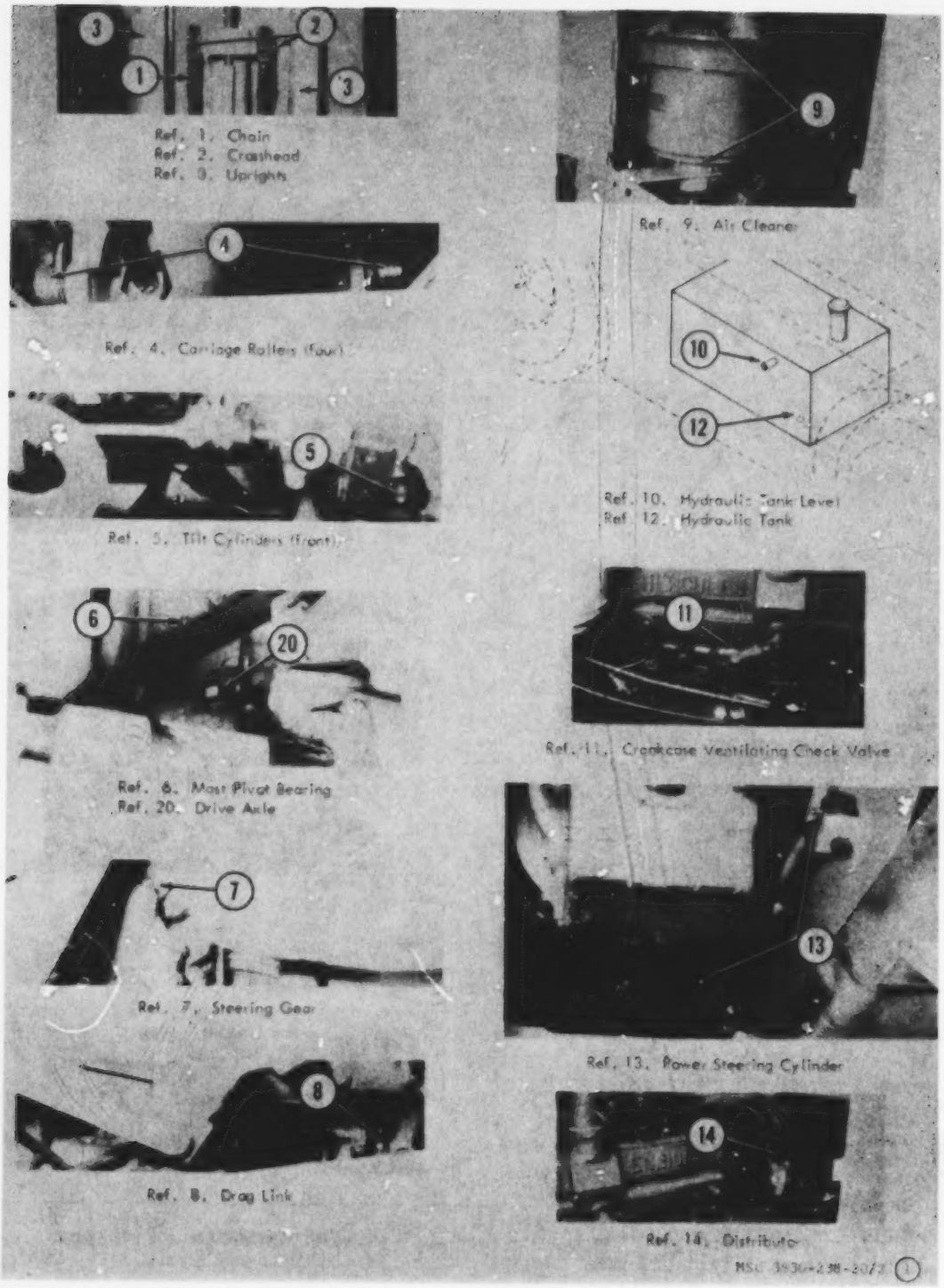

Ref. 1. Chain
Ref. 2. Crosshead
Ref. 3. Uprights
Ref. 4. Carriage Rollers (four)
Ref. 5. Tilt Cylinders (front)
Ref. 6. Mast Pivot Bearing
Ref. 20. Drive Axle
Ref. 7. Steering Gear
Ref. 8. Drag Link
Ref. 9. Air Cleaner
Ref. 10. Hydraulic Tank Level
Ref. 12. Hydraulic Tank
Ref. 11. Crankcase Ventilating Check Valve
Ref. 13. Power Steering Cylinder
Ref. 14. Distributor

Figure 2. Lubrication points.

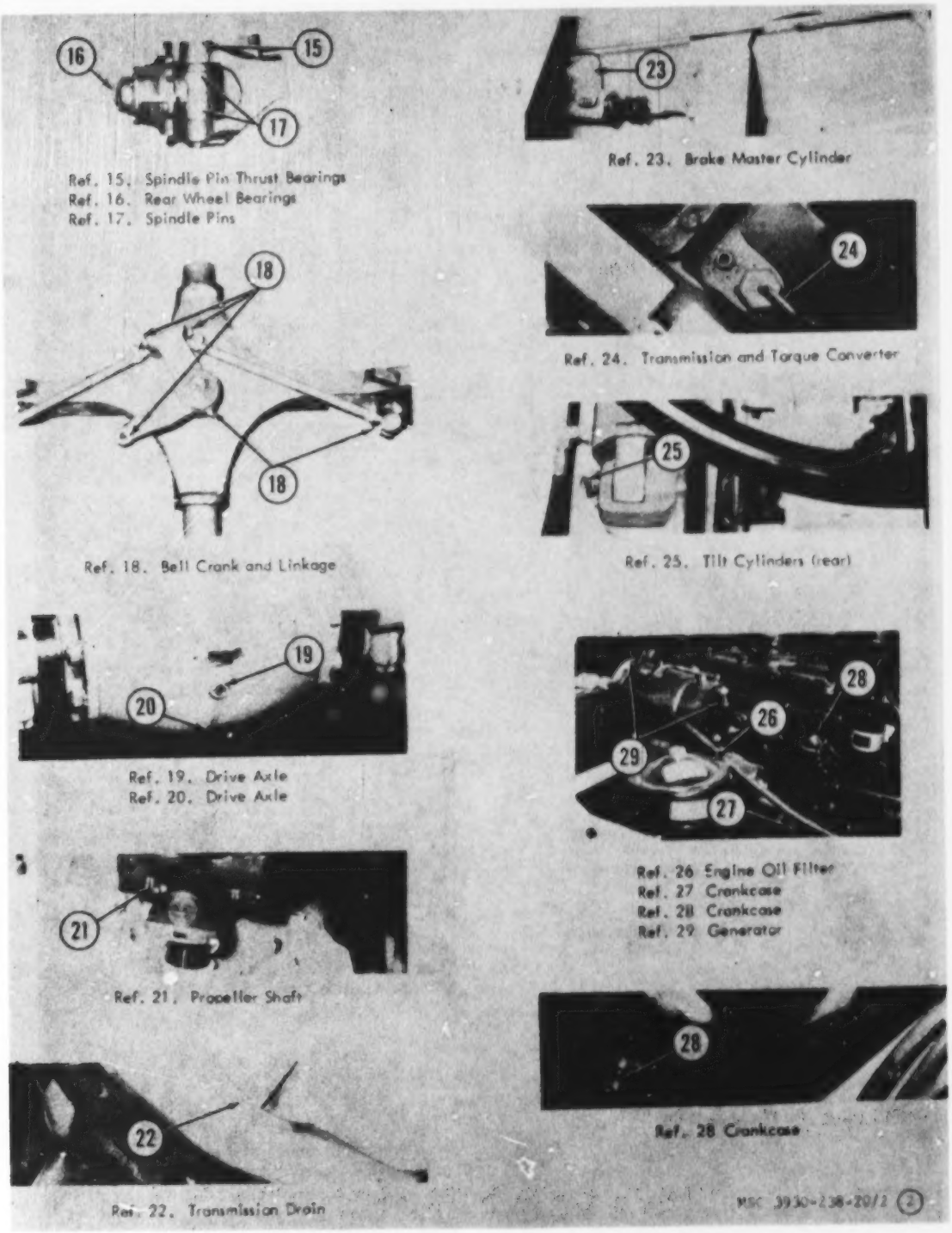
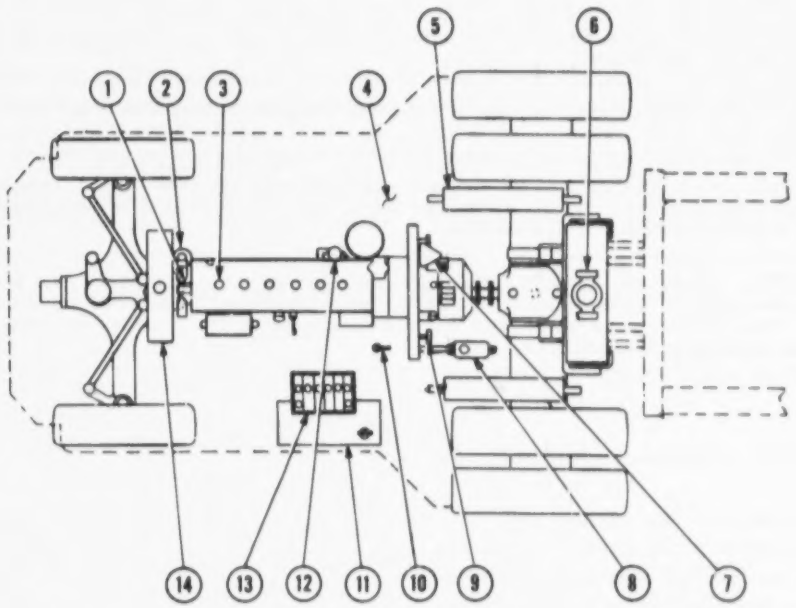


Figure 2—continued.

PREVENTIVE MAINTENANCE SERVICES
QUARTERLY

TM 10-3930-238-20 TRUCK, FORKLIFT

BAKER MODEL
FJF-060



ITEM	LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER	PAR REF
1	DRIVE BELT. Inspect for proper tension, evidence of wear of fraying, or fabric separation. Adjust or replace as indicated.	54
2	DISTRIBUTOR. Inspect point gap and condition. Inspect cap and wiring condition. Test timing. Adjust or replace defective parts as required.	60
3	SPARK PLUGS. Remove. Inspect. Clean and set gap to 0.025 inch if plug is reusable. Discard defective plugs.	61
4	FIRE EXTINGUISHER. Inspect for broken seal, and full charge.	None
5	TILT CYLINDERS. Check for leaks and secure mounting. Tighten mountings. Replace leaking cylinders.	75
6	LIFT CHAINS. Remove. Clean in SD, and inspect for wear, or cracked or broken links. Replace defective chain. Lubricate per current L.O. and adjust.	76

MSC 3930-238-20/3 (1)

Figure 3. Quarterly preventive maintenance.

ITEM		PAR REF
7	INSTRUMENT HOUSING. Check operation of components as given in text. Repair or replace as indicated.	62
8	MASTER CYLINDER. Inspect cylinder and fittings for leakage. Check pedal free travel. Test for firm (not spongy) pedal feel. Test that brakes release when pedal is released.	66
9	BRAKE AND INCHING PEDAL. Inspect, test, and adjust as given in referenced paragraph.	68
10	HANDBRAKE. Inspect operation and adjustment. Check freedom of linkage. Adjust as necessary.	65
11	FUEL TANK. Check mounting security. Clean vent hole in tank cap. Check for leaks and security of fuel line fittings.	49
12	FUEL PUMP. Remove and clean bowl and strainer. Snug down cover screws and fuel line fittings.	47
13	BATTERY. Wash with clear water. Remove cables and clean cable and battery terminals. Add water as necessary. In cold weather add water only when truck is to be used immediately. Replace worn out or cracked battery.	63
14	RADIATOR. Inspect for leaks in tanks or core. Replace defective radiator. Check hoses for cracks, aging, or leaking connections. Replace defective hoses. Tighten radiator mountings. Clean exterior. Inspect coolant for signs of lubricating oil. If oil is found refer to field or depot maintenance immediately.	53

MSC 3930-238-20/3 (2)

Figure 3—continued.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION

11. General

Lubrication Order 10–3930–238–20 prescribes lubrication maintenance of the truck; compliance with the instructions is mandatory at all levels of maintenance. The order includes lubrication instructions for normal and abnormal conditions and temperatures. If a truck is received without a lubrication order, the using organization must requisition a lubrication order through normal channels in accordance with AR 310–1.

12. Illustrations

The lubrication order is illustrated in figure 1. The numbers that have been inserted on the border of the illustration refer to specific lubrication points that are pictured in figure 2 and called out by numbers 1 through 29.

Section II. PREVENTIVE MAINTENANCE SERVICES

13. General

To insure that the equipment is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary Preventive Maintenance Services to be performed are listed consecutively and are described in paragraph 14. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the forklift truck shall be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded with the corrective action taken on DA Form 2404 at the earliest possible opportunity.

14. Quarterly Preventive Maintenance Services

a. This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by organizational maintenance personnel at quarterly intervals. A quarterly interval is equal to three calendar months, or 250 hours of operation, whichever occurs first.

b. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to figure 3 for the quarterly preventive maintenance services.

Section III. TROUBLESHOOTING

15. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the forklift truck and its components. Each trouble symptom stated is followed by a list of probable causes of the trouble. The possible remedy recommended is described opposite the probable cause. Any trouble beyond the scope of organizational maintenance shall be reported to field maintenance 3d echelon.

16. Engine Will Not Turn Over

Probable cause	*Possible remedy*
Dead battery or loose battery cables.	Blow horn. If horn does not sound, charge or replace battery. If horn sounds, check leads to starting motor terminals.

Probable cause	Possible remedy
Piston lock or seizure	With ignition off, insert a bar in flywheel housing and gently try to rotate flywheel. If flywheel will not turn easily, report condition to field maintenance.

17. Engine Turns But Will Not Start

Probable cause	Possible remedy
Weak battery	Charge or replace battery.
Faulty ignition or fuel system	Disconnect one spark plug lead and hold it about 3/16 in. from the cylinder head while cranking the engine. If a good spark occurs, and the ignition is timed, the fault is in the fuel system. If there is no spark, check ignition coil, distributor, and points.
Fuel not reaching carburetor.	With fuel in tank, disconnect fuel line at carburetor and crank engine with starter. If no fuel comes from fuel line, replace fuel pump and repeat test. If no fuel comes out on second test, inspect tank to pump fuel lines for kinks or damage, and check tank for dirt.
Carburetor flooded, due to excessive use of choke or defective carburetor.	Turn ignition switch to OFF position and wait several minutes before attempting to start engine without using choke.
No fuel in tank	Fill tank.
Intake manifold leaking.	Tighten manifold nuts; replace gasket.
Spark plug gap improperly set.	Adjust gap to 0.025 in. (par. 61).

18. Engine Does Not Develop Full Power

Probable cause	Possible remedy
Air cleaner clogged	Clean air cleaner (par. 48).
Fuel lines clogged	Clean lines.
Manifold leaking	Tighten manifold nuts. Install new gasket.
Improper ignition timing	Adjust timing (par. 60).
Engine governor improperly adjusted.	Correct adjustment (par. 50).
Valve tappet clearance incorrect.	Adjust clearance (par. 42).
Engine losing compression.	Perform compression test (par. 41).
Choke control improperly positioned.	Correct position (TM 10-3930-238-10).
Exhaust clogged	Clean exhaust system.

19. Engine Misfires

Probable cause	Possible remedy
Spark plug defective	Clean and replace plugs (par. 61).
Cylinder head gasket leaking.	Replace gasket (par. 40).
Stuck or burned valve	Refer to higher echelon of maintenance.
Spark plugs improperly gapped.	Set gap at 0.025 in. (par. 61).
Contact points sticking or improperly gapped.	Clean points and set gap at 0.022 in. (par. 60).
Improper ignition timing	Adjust timing (par. 60).

20. Engine Overheats

Probable cause	Possible remedy
Low coolant level	Add coolant to radiator.
Cylinder head gasket leaking.	Replace gasket (par. 40).
Water pump drive belt loose or worn.	Tighten or replace (par. 54).
Thermostat defective	Replace (par. 55).
Water pump defective	Replace (par. 54).
Improper ignition timing	Adjust timing (par. 60).
Cooling system clogged	Flush cooling system (par. 53).

21. Excessive or Unusual Engine Noises

Probable cause	Possible remedy
Valve tappets improperly adjusted.	Adjust (par. 42).
Improper ignition timing	Adjust (par. 60).
Low grade fuel	Drain tank and refill with proper grade of fuel.
Major engine damage	Refer to higher echelon.
Low oil supply	Fill with proper grade oil (LO 10-3930-238-20).

22. High or Low Engine Oil Pressure

Probable cause	Possible remedy
Improper grade of oil	Change to proper grade of oil for operating temperature (LO 10-3930-238-20).
Oil pressure gage inaccurate.	Replace gage. Normal operating pressure is 25 to 35 psi at 2,600 rpm.
Insufficient oil in crankcase.	Stop engine immediately and fill to prescribed level, as shown in LO 10-3930-238-20. Check for leaks while operating the engine.

23. Excessive Oil Consumption

Probable cause	Possible remedy
External oil leaks	Correct, or refer condition to field maintenance.
Faulty piston rings or valve guides.	Refer condition to field maintenance.
Improper grade of oil	Fill with correct grade of oil (LO 10-3930-238-20).
Crankcase ventilation system clogged.	Check and clean.

24. Excessive Exhaust Smoke

Probable cause	Possible remedy
Carburetor improperly adjusted.	Adjust (par. 46).

Probable cause	Possible remedy
Excessive oil supply	Drain to correct level.
Cylinder head gasket leaking.	Replace gasket (par. 40).

25. Ammeter Indicates Low Charging Rate

Probable cause	Possible remedy
Battery fully charged	Normal condition—no remedial action necessary.
Generator belt loose	Tighten or replace (par. 54).
Generator or regulator defective.	Check generator output by grounding the field terminal of regulator, with engine at fast idle speed. If the charging rate does not increase, the generator is defective and must be replaced (par. 57). If the charging rate increases to a high value, the regulator is defective and must be replaced (par. 58).

26. Ammeter Indicates High Charging Rate

Probable cause	Possible remedy
Battery charge low	Normal condition—no remedial action necessary.
Defective regulator or grounded field circuit in generator.	With battery fully charged, disconnect wire from regulator field terminal. If output remains high, check for grounded circuit in generator or harness. If output drops, the regulator is defective and must be replaced (par. 58).

27. Lights Do Not Light

Probable cause	Possible remedy
Defective lamp	Replace lamp.
Blown fuse	Check circuit for a short in wiring. Replace fuse.
Defective switch	Replace (par. 62).

28. Horn Does Not Sound

Probable cause	Possible remedy
Blown fuse	Replace fuse.

29. Brakes Drag

Probable cause	Possible remedy
Weak or broken return spring.	Replace spring (par. 65).
Improperly adjusted pedal or linkage.	Adjust pedal for free travel of ⅜ to ⅝ in. at pedal pads.
Wheel bearings loose	Refer to 3rd echelon maintenance.
Master cylinder defective.	Replace cylinder (par. 65).

30. Spongy or Soft Brake Pedal

Probable cause	Possible remedy
Air in system	Bleed system (par. 66).
Inadequate fluid supply	Fill master brake cylinder.
Improperly fitted brake linings.	Replace linings (par. 65).

31. Hard Brake Pedal

Probable cause	Possible remedy
Improperly adjusted linkage.	Adjust pedal linkage (par. 68).
Glazed brake linings	Replace brake shoes (par. 65).

32. Excessive Pedal Travel Required to Apply Brakes

Probable cause	Possible remedy
Air in system or inadequate fluid supply.	Pump brake pedal several times. If pedal builds up to normal travel, refer to 3rd echelon maintenance for shoe adjustment. If normal travel does not occur, fill master brake cylinder.

33. Truck Pulls to One Side

Probable cause	Possible remedy
Fluid or grease on brake lining.	Replace brake shoes (par. 65).
Wheel bearings loose	Refer to field maintenance.
Defective wheel cylinder	Replace cylinder (par. 67).
Brakeshoe return spring defective.	Replace spring (par. 65).

34. Difficult Steering

Probable cause	Possible remedy
Steering linkage inadequately lubricated.	Lubricate as shown on LO 10–3930–238–20.
Low oil level in power steering hydraulic system.	Fill to proper level as shown on LO 10–3930–238–20.
Leaks in hydraulic system.	Inspect and correct.
Binding in steering linkage.	Inspect and correct.
Restrictions in lines	Clean lines and remove restrictions.

35. Erratic Steering Control

Probable cause	Possible remedy
Low oil level in hydraulic system.	Fill to proper level as shown on LO 10–3930–238–20.
Leaks in hydraulic system.	Inspect and correct.
Loose steering linkage	Inspect and correct.
Loose rear wheel bearings.	Refer to field maintenance.

36. Lift and Tilt Mechanism Will Not Lift Rated Load

Probable cause	Possible remedy
Insufficient fluid in hydraulic tank.	Fill to prescribed level as shown on LO 10–3930–238–20.
Leaks in hydraulic system.	Inspect fiittings and hose. Tighten connections. Install new hose if necessary.
Defective hydraulic pump.	Refer to field maintenance.

37. Lift and Tilt Mechanism Lifts but Will Not Lower Load

Probable cause	*Possible remedy*
Control valve defective	Report condition to field maintenance.

38. Load Creeps Down from Raised Position

Probable cause	*Possible remedy*
Oil lines leaking	Refer to field maintenance.
Oil leak in either intake line connection or packing glands.	Refer to field maintenance.

Section IV. ENGINE (GROUP 01)

39. General

The engine is a six cylinder L-head unit, with battery ignition. The cooling system includes a front mounted water pump, driven by a V-belt from the crankshaft, a radiator mounted behind the engine, and a thermostat in the cylinder head water outlet, to maintain a constant efficient operating temperature of the engine. The ignition system consists of a coil, a conventional distributor, resistor spark plugs, the necessary wiring and cabling, and radio interference suppression components, consisting of one 10,000 ohm resistor in the coil-to-distributor high tension cable, one 0.25 Ufd capacitor connected from the coil side of the ignition switch to ground and one placed from the ignition switch side of the coil to ground. The engine fuel system includes a mechanical fuel pump, an updraft single-bore carburetor with air cleaner, and the required fuel lines and manifolding. Since the engine is installed with the flywheel end toward the front of the vehicle, and the fan and timing gears to the rear, reference to the front of the engine will imply the flywheel end. Cylinder, spark plug and bearing numbering begins at the timing gear, or fan end, of the engine. This section of the manual covers those phases of engine maintenance which are the responsibility of the second maintenance echelon.

40. Cylinder Head

a. Removal.

(1) Open petcock at bottom of radiator and drain coolant. If coolant is clean, save it for reuse after assembly.

(2) Remove bypass tube (fig. 4), hose clamps and upper hose, and thermostat housing and gasket.

(3) Remove lead to temperature transmitter, and remove transmitter. Remove spark plugs, and plug cables from cylinder head.

(4) Remove all head bolts, washers and capscrews. Lift off cylinder head. Remove and discard head gasket.

b. Cleaning.

(1) Soak cylinder head in SD. Dry with compressed air and clean rags.

(2) Scrape carbon from inside of combustion chamber area with carbon scraper, or use a wire brush. Do not scratch surface when scraping.

(3) Scrape or brush gasketed surface to remove gasket paste residue.

c. Installation. Reverse *a* above, using new gaskets. Tighten head bolts 8, 10, 12, 14, 15, 17, 18, 20, 22 and 24, fig. 5, to 80 ft lbs torque. Tighten all others to 90 ft lbs.

41. Engine Test

a. Test compression as follows:

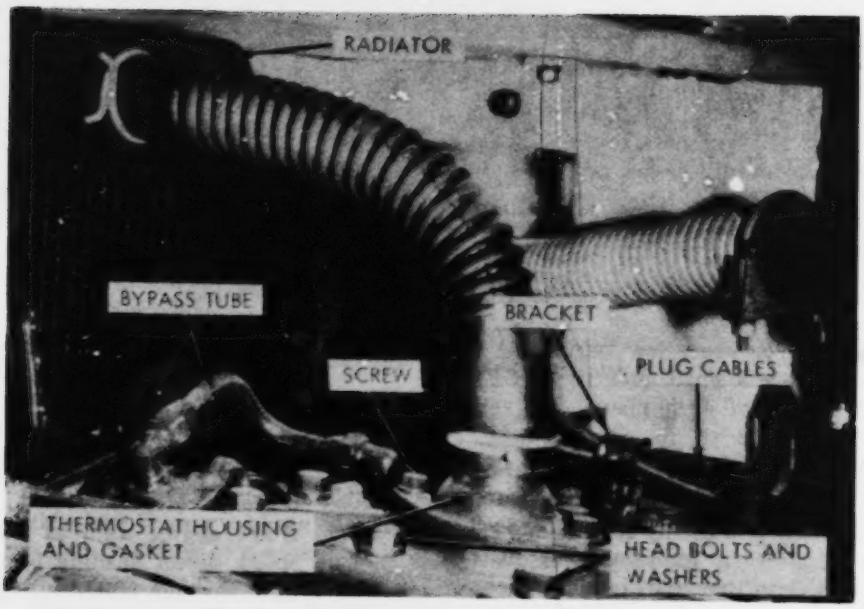
(1) With engine warmed up, remove plug cables (fig. 4) from spark plugs, loosen plugs ½ to one turn, reinstall cables and start and run engine for at least thirty seconds, to get rid of carbon loosened by plug loosening.

(2) Turn ignition switch OFF (or ground coil high tension lead) and remove all spark plugs. Put transmission in NEUTRAL.

(3) Insert compression tested in spark plug hole (using adapter if necessary) (fig. 6) and crank engine for at least four compression strokes. Note reading on first full stroke as well as on final stroke. (See test indications below.)

Note. All cylinders must be tested the same number of compression strokes to assure accurate readings. Slightly higher compression readings will be obtained if throttle and choke are opened during test.

(4) Refer to manufacturer's specifications for proper cranking compression pressure.



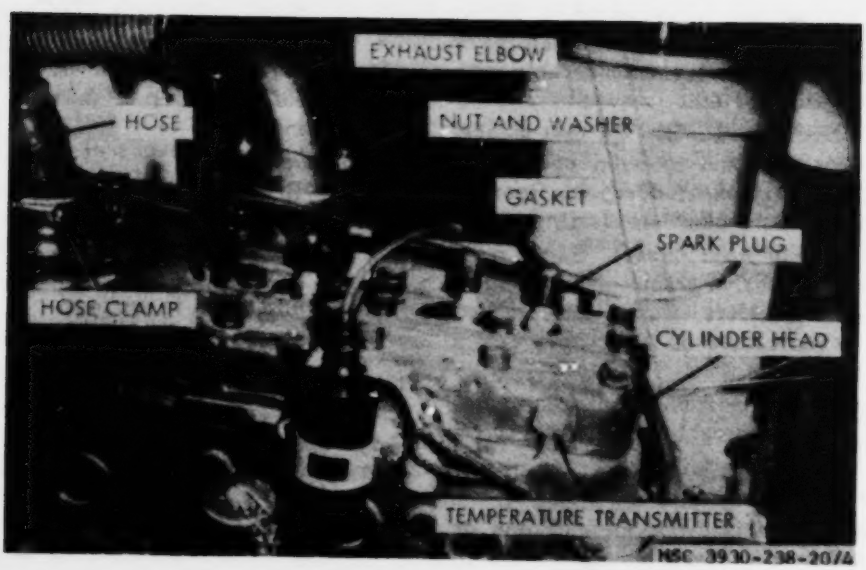


Figure 4. Engine.

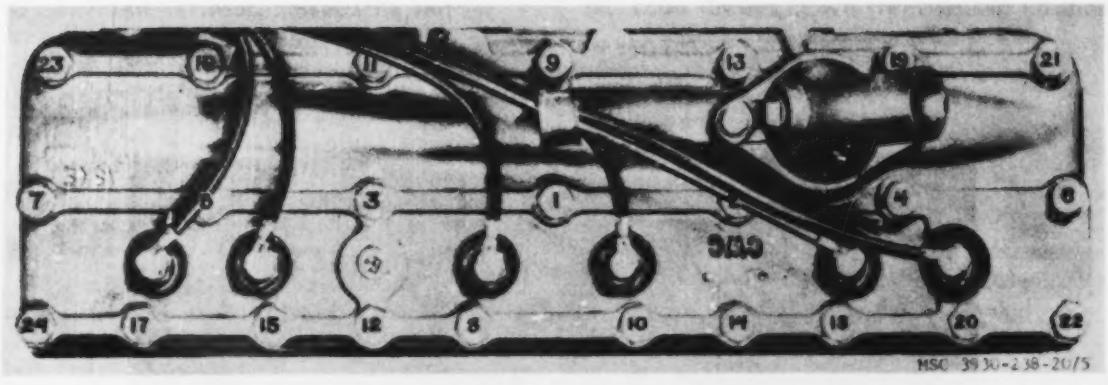


Figure 5. Head bolt tightening sequence.

(5) If readings are below normal or uneven, place a small quantity of OE 30 oil on top of each piston and retest compression.

(6) *Test indications.*

(*a*) *Normal.* Compression builds up quickly and evenly to specified compression on each cylinder, varies less than 10 pounds between highest and lowest reading cylinders.

(*b*) *Ring trouble.* Compression low on first stroke, tends to build up on following strokes but does not reach normal. Improves considerably with addition of oil.

(*c*) *Valve trouble.* Low on first stroke, does not tend to build up on following strokes; does not improve much with addition of oil.

(*d*) *Leaking head gasket.* Same reaction as valve trouble on two adjacent cylinders, usually accompanied by indications of water in cylinders and/or oil.

(*e*) *Carbon deposits.* Compression pressure considerably higher than specified.

b. Engine Ignition Timing Check.

(1) Remove cable from number one or number six spark plug and install adapter (fig. 7) to connect timing light.

***Caution.* Use adapter. Do not puncture insulation to make connection.**

(2) Connect timing light spark plug lead as shown, and power leads to battery terminals.

Note. If available equipment requires different power connection procedures, such as conection to a 115 volt source, use appropriate procedures.

(3) Start engine and, at 450 rpm idle speed, direct flashing beam of timing light through hole in flywheel housing at distributor side of engine (fig. 7). If ignition timing is correct, light flash will show D-C on flywheel aligned with mark on flywheel housing as plug fires. If timing is not correct, refer to par. 60 for adjustment.

c. Vacuum Test.

(1) Remove slotted plug from check valve (fig. 8) adapter Tee-fitting to intake manifold and install an adapter to receive vacuum gage hose. Connect vacuum gage to adapter.

(2) With engine warm, and idling at 450 to 500 rpm, vacuum gage reading should be between 17 and 21 inches of mercury, and steady. General indications are as follows:

(*a*) As in (2) above: not trouble indicated.

(*b*) Slow oscillation of gage reading, usually with drifting engine idle speed: carburetor idle mixture adjustment wrong. (Refer to par. 46*a*).

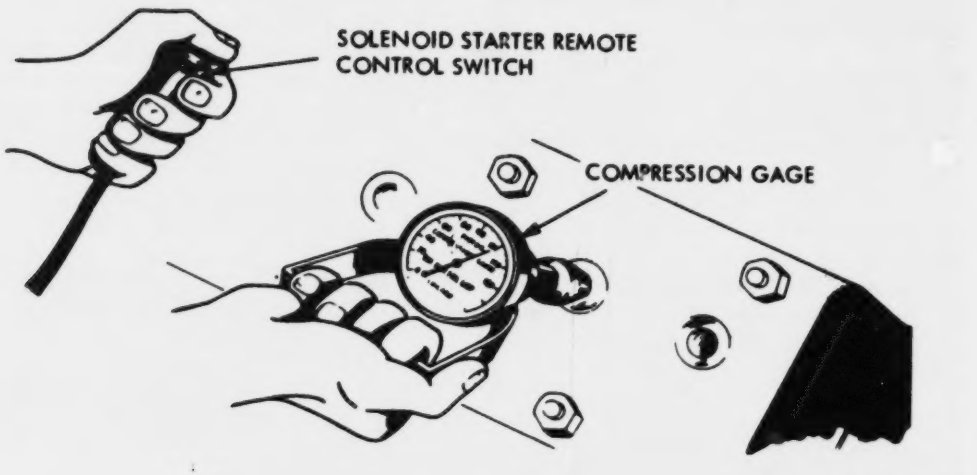


Figure 6. Compression test.

(*c*) *Low, steady* reading: power loss affecting all cylinders equally. Possibly late timing, leaking induction system or rings, or mechanical drag on engine, such as tight bearings.

(*d*) Steady pulsing of gage: partial or complete loss of power in one (or more) cylinders. Burned or stuck valve or leaky head gasket gives major pulsations. Fouled spark plug gives lesser fluctuations. Cross check indications with compression test (*a* above).

42. Valve Adjustment

a. Remove valve covers (par. 43).

b. To the extent necessary to provide working room during valve adjustment, disconnect th. following items (fig. 8):

(1) Air duct (at carburetor).
(2) Throttle, choke, and governor linkages (at carburetor).
(3) Fuel line (at fuel pump intake), and fuel line from fuel pump to carburetor (remove completely).
(4) Fuel pump (remove two capscrews and washers, and remove pump).

c. Crank engine by hand until D-C mark appears at hole in flywheel housing. At this time both valves will be open (tappets cannot be turned with fingers) at No. 1 cylinder, and both closed at No. 6 cylinder or vice versa, depending on whether No. 1 or No. 6 piston is in firing position. If No. 1 valves are open, adjust valve clearance on cylinders 3, 2 and 6, then turn the engine one full revolution and adjust valves for cylinders 1, 5 and 4, as follows:

(1) Insert feeler gage (corresponding to valve clearance given on engine data plate) between tappet adjusting screw and valve stem cap (fig. 9).
(2) Hold tappet with $\frac{9}{16}$ inch end of one tappet wrench, and turn adjusting screw with $\frac{1}{2}$ inch end of second wrench until feeler gage fits with slight drag. Repeat for all valves.

d. Restore engine to operating condition by reversing *b* and *a* above.

43. Valve Cover

The engine has two valve covers. These covers are removed for valve service, or replacement of the gaskets.

a. *Removal.*

(1) Remove tube from rear valve cover to crankcase ventilating check valve (fig. 8).
(2) Remove two screws holding each cover in place and lift off valve covers

with cover gaskets. Discard gaskets.

b. Installation. Reverse *a* above, installing new cover gaskets.

44. Oil Filter

a. Element Replacement.

(1) Unscrew screw in center of oil filter cover (fig. 10) and remove cover and cover gasket. Discard gasket.

(2) Lift out filter element carefully to avoid getting dirty oil on truck or clothing. Discard element.

(3) Clean residue from inside filter, wipe outside clean, install new element and cover gasket, and reinstall cover and cover screw.

b. Filter and Lines Removal.

(1) Remove and tag leads to hour meter switch and oil pressure transmitter, and remove switch and transmitter, shown in phantom in fig. 10.

(2) Remove pressure line, bushing and cross fitting. Remove return line from bottom of filter housing, and from elbow.

(3) Remove nuts, screws and washers that mount filter and remove filter from truck.

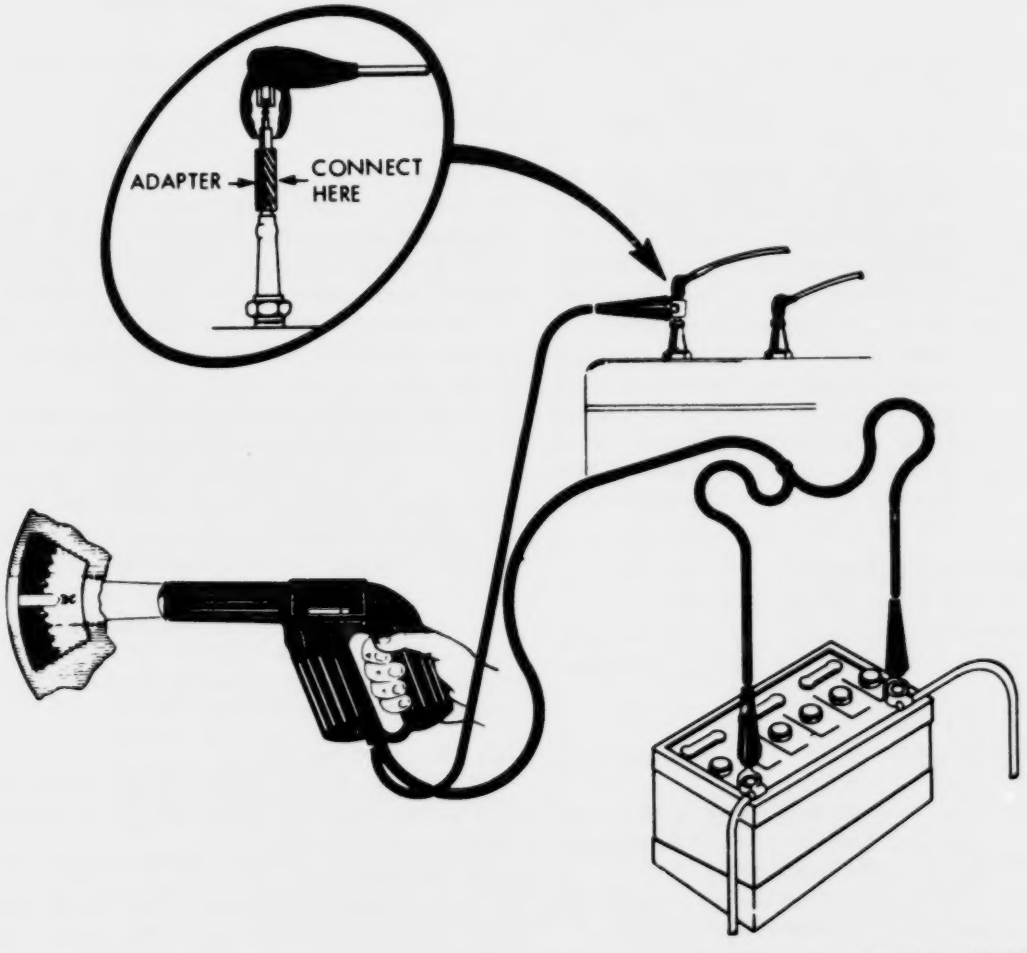


Figure 7. Ignition timing.

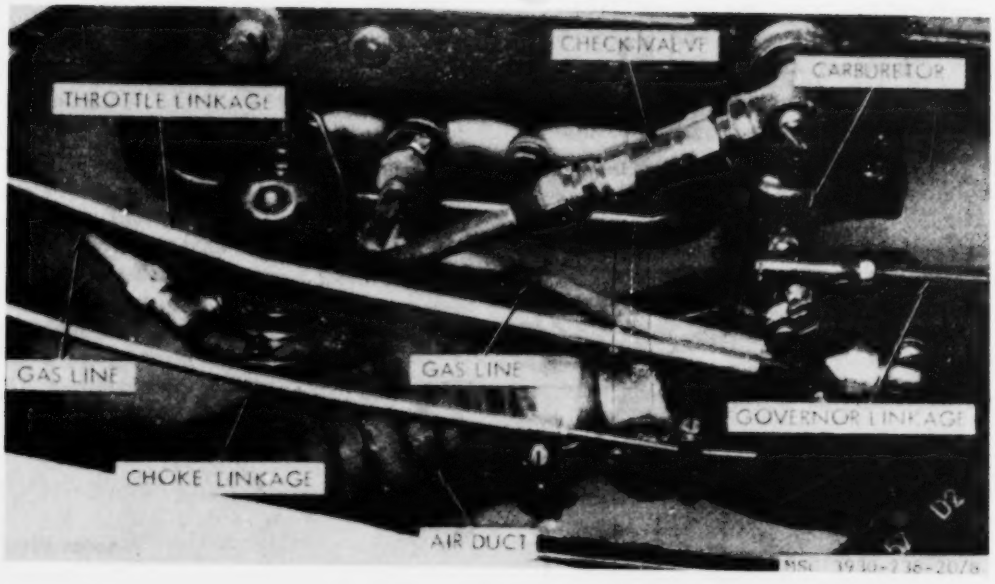


Figure 8. Engine, left side view.

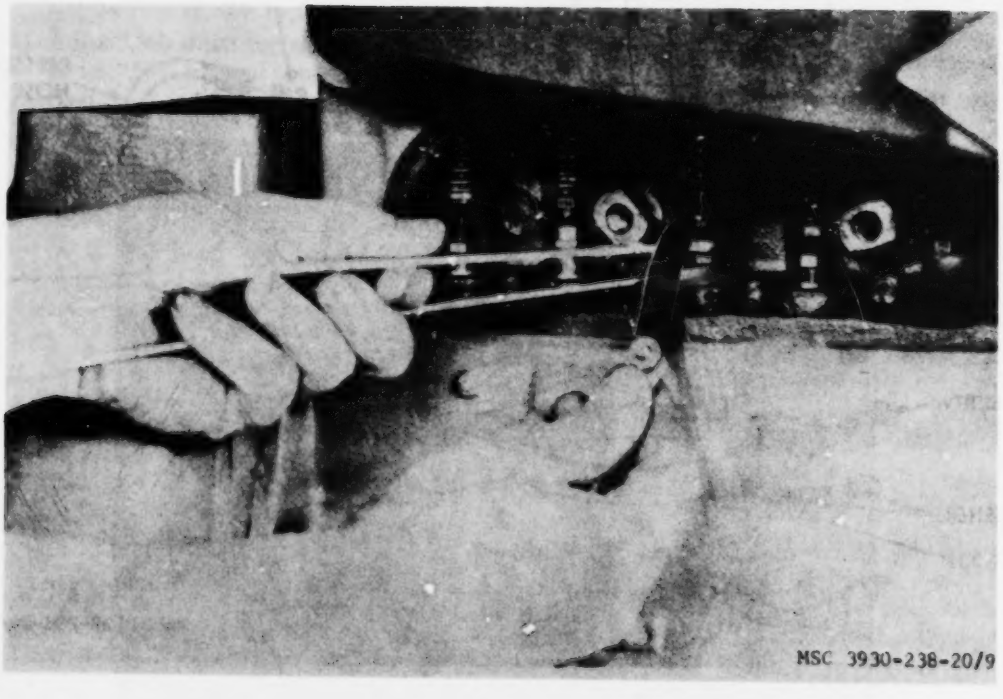


Figure 9. Adjusting valves.

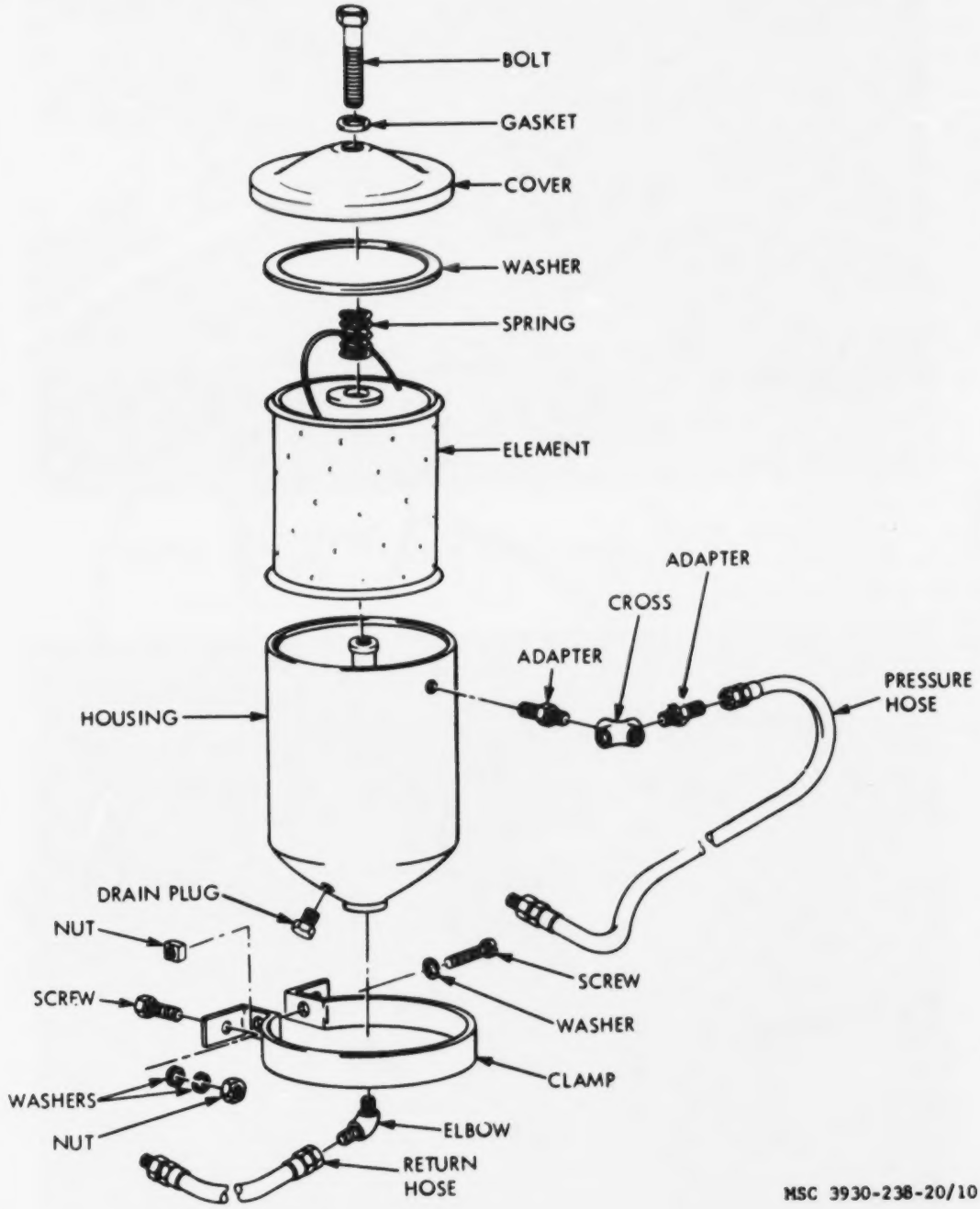


Figure 10. Engine oil filter, exploded view.

c. Filter and Lines Installation. Reverse *b* above.

45. Intake and Exhaust Manifolds

a. Removal.

(1) Disconnect carburetor air duct, throttle, choke, and governor linkages (fig. 8) at carburetor. Remove gas line from fuel pump to carburetor.

(2) Remove two nuts and washers and remove carburetor and gasket.

(3) Remove tube to check valve at manifold and remove check valve and its adapter from the manifold.

(4) Remove two nuts and washers (fig. 4), exhaust elbow flange and gasket.

(5) Remove six nuts and washers (fig. 11) and remove manifold and gasket. Discard gaskets removed.

b. Cleaning. Soak manifold in SD long enough to soften crusted deposits. Clean machined surface with flat bladed scraper. Clean bores of passages with scraper and wire brush. Dry with clean cloths.

c. Inspection. Inspect for warpage at machined surface with straight edge. Replace manifold if warpage is bad enough to be possible source of leaks. Check for cracks in casting.

d. Installation. Using new gaskets, reverse *a* above.

Section V. FUEL SYSTEM (GROUP 03)

46. Carburetor

a. Adjust.

(1) Connect vacuum gage to intake manifold (par. 41*c*), and tachometer to engine. Start and warm up engine.

(2) With throttle screw (fig. 12), adjust engine idle to 450 to 500 rpm.

(3) Adjust idle mixture screw to setting giving the highest possible vacuum reading.

Note. When making idle mixture adjustment, maintain given idle speed with throttle screw.

b. Removal. Refer to par. 45*a* (1) and (2).

c. Installation. Reverse procedures in par. 45*a* (1) and (2). Carburetor mounting gasket may be reused if it is not damaged.

47. Fuel Pump

fig. 12

a. Cleaning.

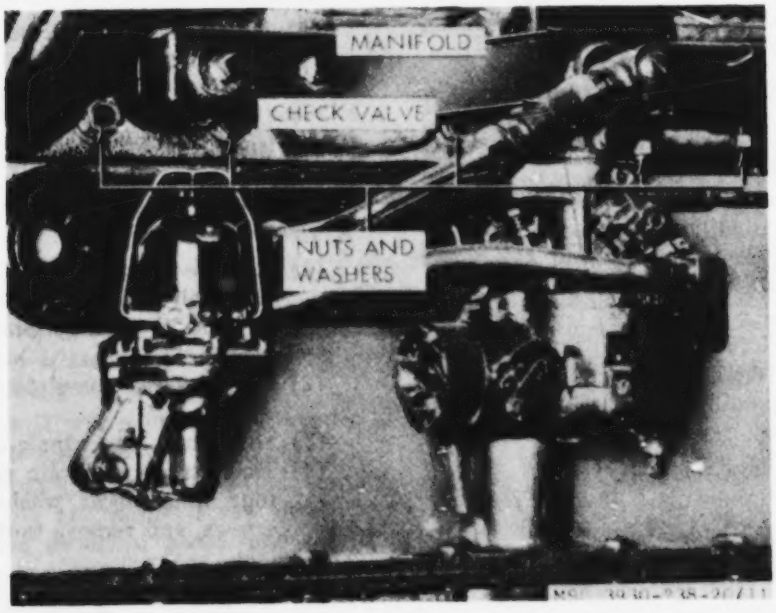


Figure 11. Engine manifold.

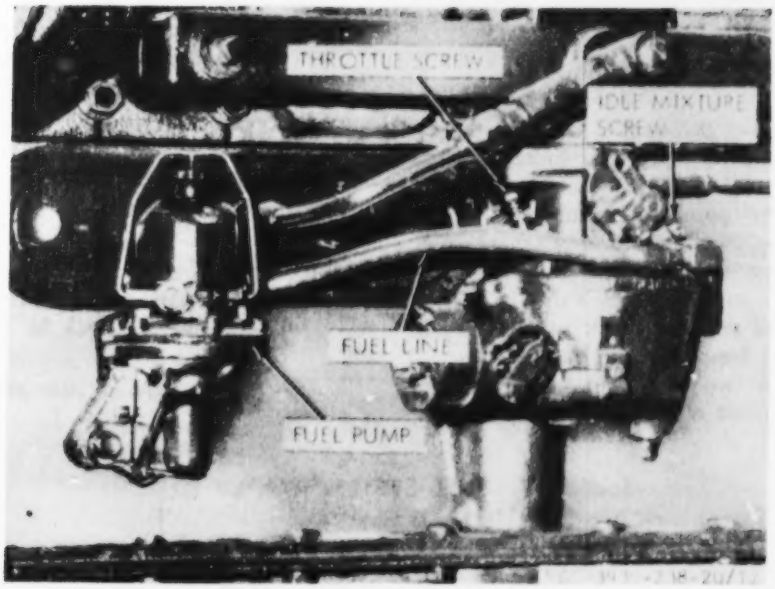


Figure 12. Carburetor adjustments.

(1) Loosen nut (fig. 13), remove bail, bowl, screen and gasket from pump. Discard gasket.

Caution. **Some gasoline will probably be spilled at this time from the bowl. Take precautions against fire.**

(2) Rinse bowl and screen in SD, and reassemble, using a new gasket between bowl and pump.

b. Test.

(1) With fuel in tank, disconnect fuel line at carburetor and install fuel pressure gage.

(2) Crank engine for twenty to thirty seconds and note gage reading. Pressure between 1½ psi and 2¼ psi is required.

c. Removal.

(1) Shut off fuel supply at tank, and disconnect both fuel lines at fuel pump.

(2) Remove both screws and washers (fig. 13), and remove pump and gasket from engine.

d. Installation. Reverse *c* above.

48. Air Cleaner

a. Removal. Loosen clamp (fig. 14) and lift off air cleaner.

Note. Don't tip air cleaner, to avoid spilling oil.

b. Cleaning.

(1) Remove air cleaner (*a* above).

(2) Unscrew wing bolt, remove cover and element, and pour off old oil from air cleaner body.

(3) Wash all parts of air cleaner in SD, and dry.

(4) Saturate mesh of element in OE. Permit excess to drain.

(5) Reinstall body of air cleaner, fill to OIL LEVEL line with OE, and install cover and element and wing bolt.

49. Fuel Tank

a. Removal.

(1) Remove drain plug (fig. 15) and drain all fuel into a container. Observe safety precautions for handling gasoline.

(2) Unscrew cap complete from tank fill neck.

(3) Disconnect pipe nipple from elbow.

(4) Hoist truck to obtain access, remove four nuts, eight washers and four screws, and remove tank from below.

b. Cleaning.

(1) Remove tank (*a* above).

(2) Put one gallon SD in tank and slosh

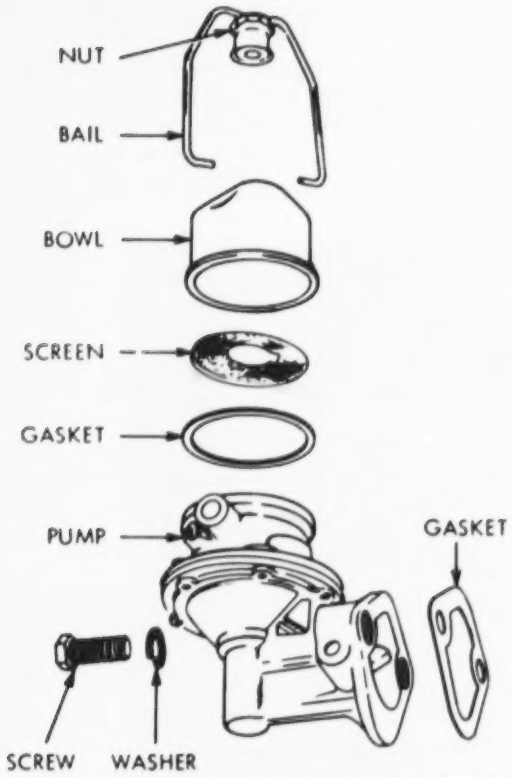


Figure 13. Fuel pump, exploded view.

it around. Pour out SD quickly through fill pipe, to carry out sediment.

(3) Air dry tank interior and install tank by reversing *a* above.

50. Governor and Controls

a. Adjustment.

(1) Connect a tachometer to the engine to read engine rpm.

(2) Start and warm up engine to operating temperature.

(3) Loosen locknut on speed adjust screw (fig. 16) and adjust screw down to increase governed speed, and up to decrease speed.

(4) Tighten locknut to retain governor setting. If engine speed surges at governed speed, loosen locknut on surge adjust screw, and turn screw in until surging ceases.

b. Removal.

(1) Remove radiator (par. 53).

(2) Remove nuts and lockwashers from both ends of linkage to carburetor and remove linkage.

(3) Remove capscrews shown, from top and bottom of governor mounting flange, and remove governor.

51. Throttle and Choke Controls

a. Throttle Linkage Removal (fig. 17).

(1) Pull toe end of pedal up until free of pedal rod ball. Unhook return spring at both ends. Remove cotter pins at each end of cross shaft, outer two washers, cotter pin and clevis pin at front of throttle rod, and remove cross shaft and pedal rod.

(2) Remove clip at carburetor end of throttle rod and remove throttle rod.

b. Throttle Linkage Installation. Reverse *a* above.

c. Adjustment (fig. 17).

(1) With linkage installed, depress pedal by hand until carburetor throttle is fully open. Adjust pedal down stop to contact under surface of pedal at this point.

(2) With carburetor idle speed and mix-

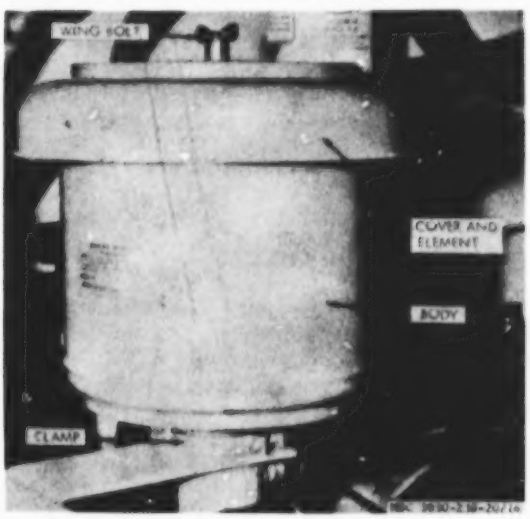


Figure 14. Air cleaner.

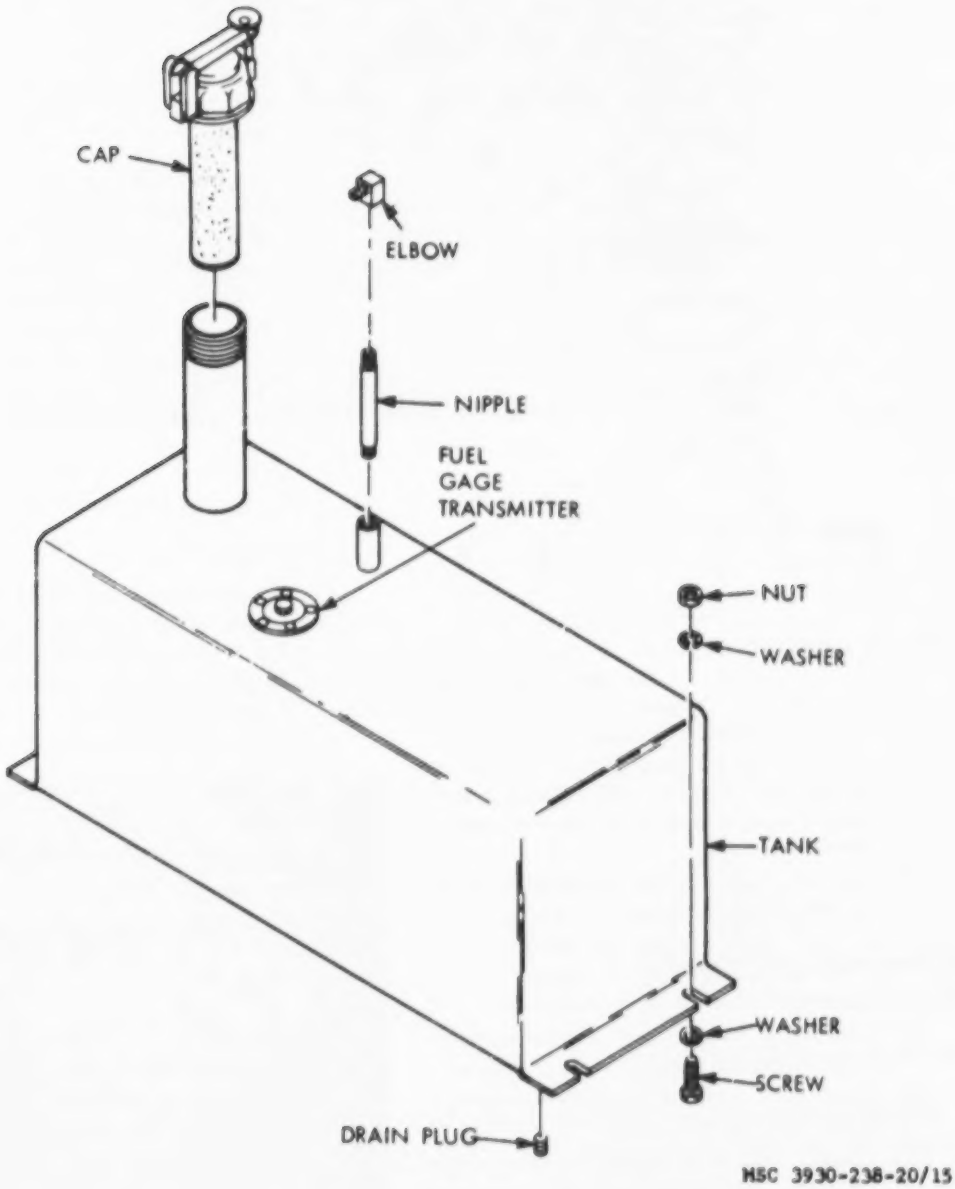


Figure 15. Fuel tank removal.

ture adjusted (par. 46*a*) and spring holding pedal and linkage at idle position, adjust pedal up stop to contact arm of cross shaft.

d. Choke Linkage Removal.

(1) Loosen screw (fig. 18) holding choke wire to carburetor, and screw clamping choke cable.

(2) Remove nut and washer from underside of choke knob mounting and withdraw choke cable and knob from truck.

e. Choke Linkage Installation. Reverse *d* above.

f. Adjustment. Loosen choke wire screw at carburetor, open choke valve fully by hand, press choke knob fully down, and tighten choke wire screw.

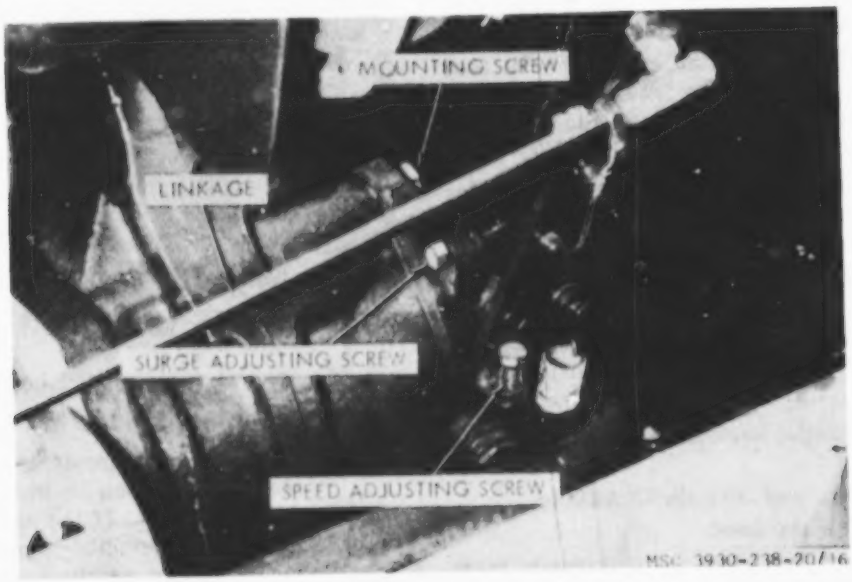


Figure 16. Governor and linkage.

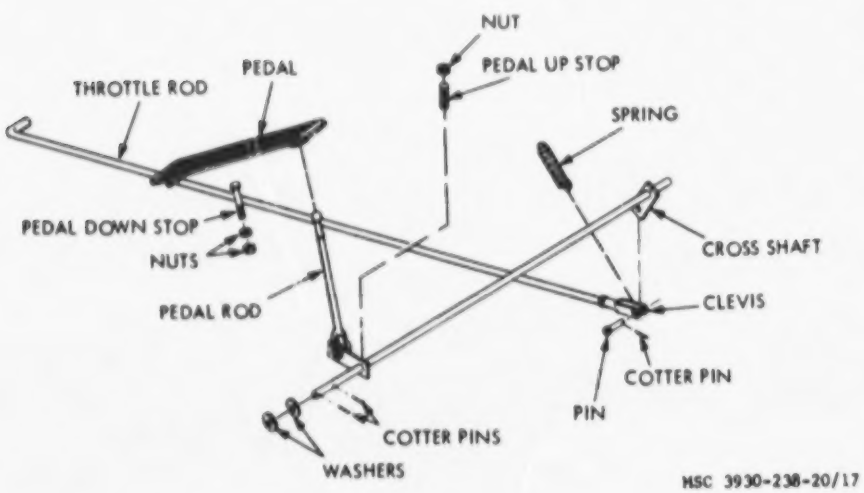


Figure 17. Carburetor linkages.

Section VI. EXHAUST SYSTEM (GROUP 04)

52. Muffler and Pipes

a. Inspection. Inspect installation for leaks, corrosion and security of attachment.

b. Removal. Remove two nuts and washers (fig. 19) holding flange to manifold. Remove two nuts holding muffler strap to truck. Remove muffler and pipes from truck.

c. Installation. Reverse *b* above.

Section VII. COOLING SYSTEM (GROUP 05)

53. Radiator

a. Removal (fig. 20).

(1) Remove radiator cap. Remove four screws securing radiator cover on rear deck of truck and remove cover.

(2) Drain cooling system.

(3) Disconnect inlet (upper) radiator hose and outlet (lower) radiator hose secured with clamps.

(4) Disconnect transmission cooling lines secured with clamps and cap the lines.

(5) Remove four screws, nuts, lockwashers and flat washers securing radiator. Lift radiator from truck.

b. Installation. Reverse removal procedure in *a* above.

c. Inspection and External Cleaning.

(1) Raise the hood.

(2) Clean dirt, insects, and trash from the exterior of the core, using compressed air or a stream of water applied carefully from the engine side of the core.

(3) If the core fins are bent, use a piece of wood or a blunt instrument to straighten them. Be careful not to puncture the tubes.

(4) Inspect radiator mounts and tighten them as necessary.

(5) Be sure radiator hose clamps are tight.

(6) Inspect radiator and hoses for leaks.

d. Draining and Refilling.

(1) To drain cooling system, remove radiator cap and open drain cocks in radiator and block. If the cooling system is not to be refilled immediately, attach a notice on the steerling wheel

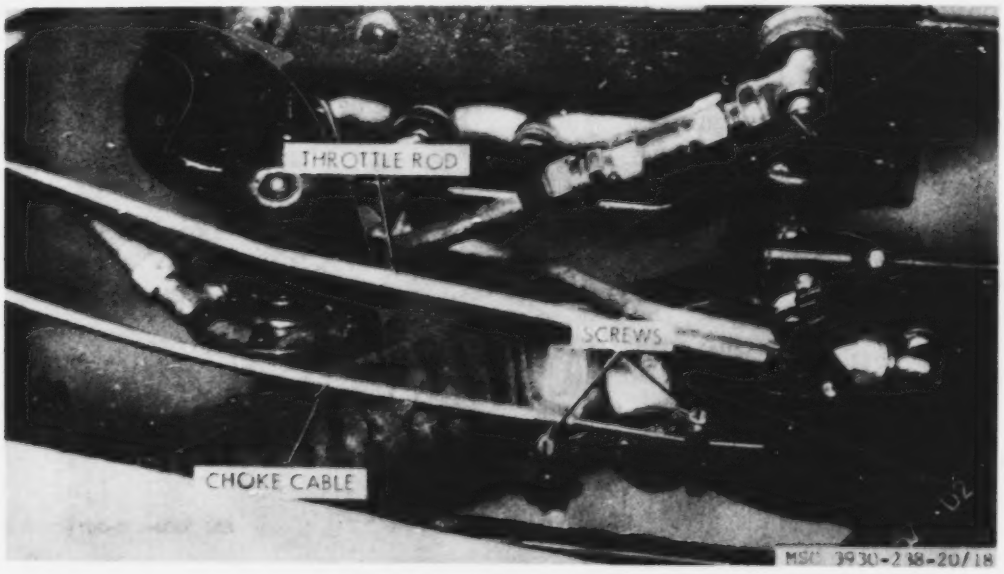


Figure 18. Choke linkage.

to warn personnel that the cooling system has been drained.

(2) To refill the cooling system, close drain cocks and add water, corrosion inhibitor (*h* below), and antifreeze (*g* below) as required. Operate the engine, inspect the coolant level, and add coolant as necessary. Install the radiator cap.

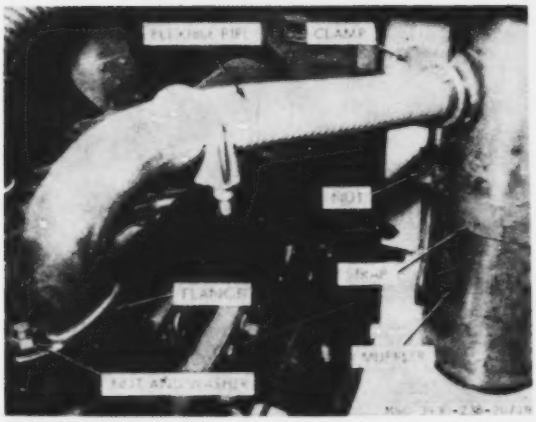


Figure 19. Muffler and exhaust pipes.

e. Cleaning and Flushing. Follow instructions provided with cleaning compound.

f. Pressure Flushing. When overheated condition is not corrected by normal cleaning and flushing, proceed as follows:

(1) Drain the cooling system.
(2) Remove the upper radiator hose from top radiator inlet.
(3) Remove the thermostat (par. 55) and install thermostat housing.
(4) Remove the lower radiator hose from bottom radiator outlet and install a lead-away hose.
(5) Install the pressure gun (one using air pressure to force water) to upper radiator hose.

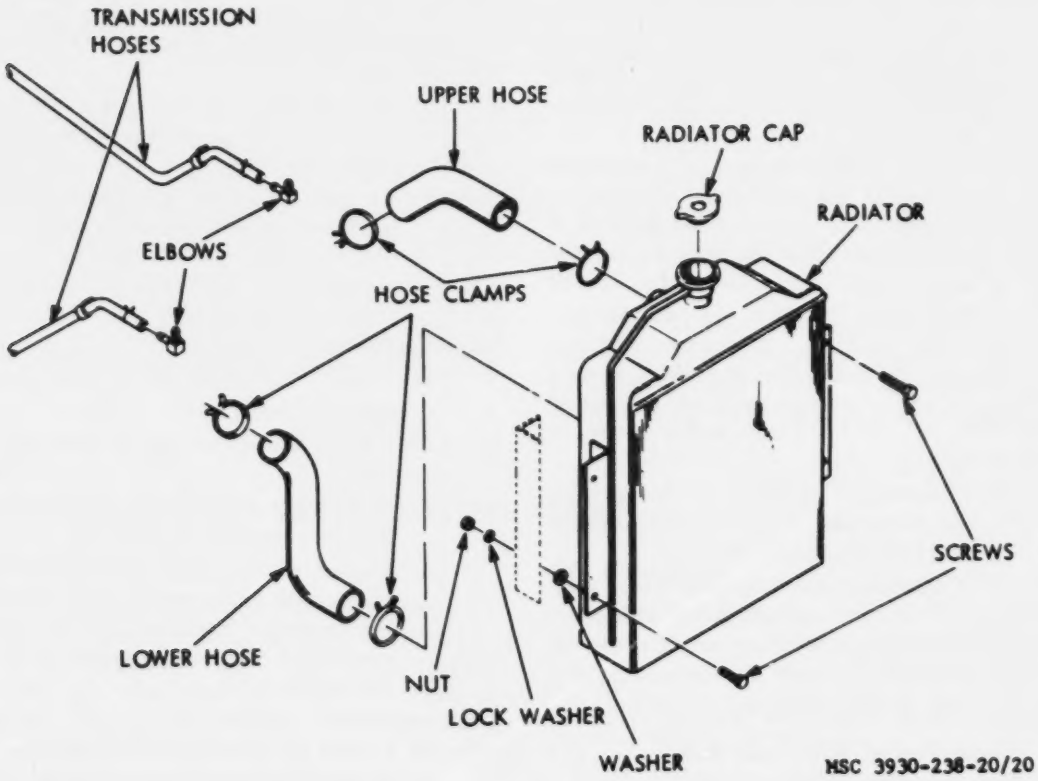


Figure 20. Radiator and lines, exploded view.

(6) Force the water through block until water runs clean.

(7) Remove the gun, connect bottom hose to radiator and disconnect it from pump. Install gun on hose at bottom of radiator.

(8) Install a lead-away hose to radiator inlet.

(9) With the radiator cap installed, force water through the radiator until the water runs clean.

(10) Close the drain cock, install the thermostat and hoses, and fill the radiator with proper coolant.

g. Antifreeze Protection.

(1) In cold weather, add antifreeze to the radiator to protect the cooling system. Table I shows the quantity of approved antifreeze compound required to protect the 14-quart cooling system.

(2) After filling the radiator with necessary antifreeze compound, allow the engine to run until normal operating temperature is reached. Check strength of antifreeze with a hydrometer.

(3) Before adding water to a radiator containing the antifreeze solution, allow engine to run until the solution is well mixed. Test the solution with a hydrometer and add water and/or antifreeze compound as necessary.

h. Corrosion Inhibitor. To prevent rust and scale, and to extend the life of cooling system components, add corrosion inhibitor compound (FSN 6850–281–1989) to the cooling system in the following amounts:

(1) When water is used as the coolant, add 8 ounces of corrosion inhibitor to the 14 quarts of water.

(2) If a denatured alcohol and water solution is used as emergency antifreeze protection, add 1 ounce of corrosion inhibitor to each 2 quarts of water used in the solution.

54. Water Pump, Fan, and Belt

a. Removal (fig. 21).

(1) Loosen generator adjusting strap bolt at water pump.

(2) Loosen generator mounting bolts securing generator to mounting support and remove belt from generator and crankshaft pulleys.

Table I. Antifreeze Requirements.
(14-quart cooling system)

Lowest safe temperature (degrees fahrenheit)	Ethylene glycol (quarts)
26	1
18	2
8	3
—6	4
—23	5
—47	6
—62	7
Lower than —63*	

* Use arctic-grade antifreeze, undiluted (FSN 6850-174-1806).

(3) Work fan belt over fan blade and rotate fan until belt can be removed from the fan.

(4) Remove bolts and lockwashers that secure fan to hub. Remove fan.

(5) Drain radiator.

(6) Disconnect bypass tube at water pump and at thermostat elbow and remove from engine.

(7) Loosen outlet (lower) radiator hose clamp and separate hose from water pump.

(8) Remove mounting capscrews and lock washers, remove adjusting strap cap screws, and remove water pump and gasket from engine block. (Bottom capscrew has copper washer.)

b. Inspection.

(1) Inspect the pump for secure mounting.

(2) Inspect the water pump bearing for noise.

(3) Inspect the fan for secure mounting, bent or cracked blades.

(4) Inspect the fan belt for wear, frays, and proper adjustment of ½-inch finger-pressure deflection at midpoint between the crankshaft pulley and the fan pulley.

c. Adjustment of Belt.

(1) Loosen the generator adjusting strap bolt and the generator mounting bolts.

(2) Pivot generator for desired belt tension (*b*(4) above) and tighten ad-

justing strap bolt and generator mounting bolts.

d. Installation. Reverse procedure in *a* above and replace gasket.

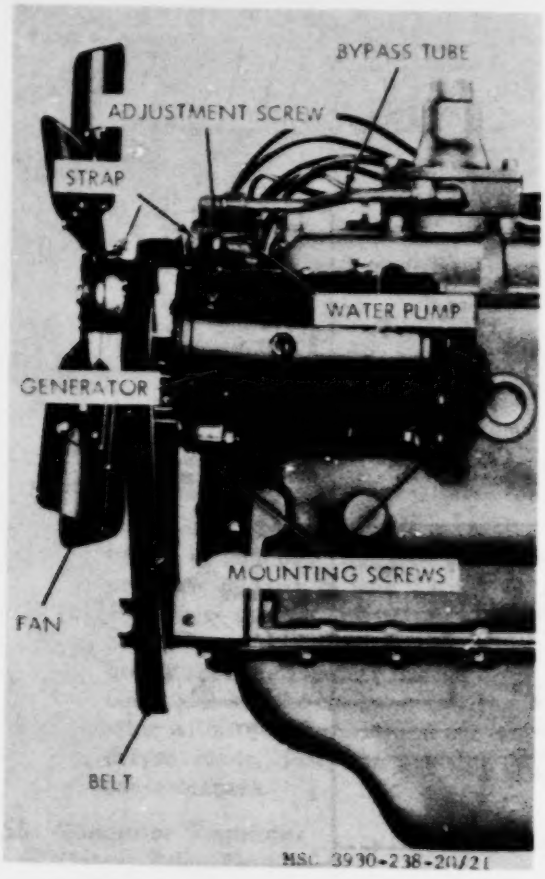


Figure 21. Water pump, fan and belt.

55. Thermostat and Elbow

a. Removal.

(1) Drain cooling system.

(2) Loosen hose clamp and remove upper hose from elbow.

(3) Remove bypass tube from truck.

(4) Remove nuts and lockwashers that secure elbow to cylinder head and remove elbow with thermostat and adapter. Separate thermostat and adapter from the elbow and remove recirculating tube elbow. Remove the gasket from the cylinder head.

b. Testing.

(1) Suspend thermostat in a container of water so that it does not touch the bottom of the container.

(2) Heat water and check temperature with a thermometer. The thermostat valve should start to open at about 160°F and should be fully open at 180°F.

(3) If the thermostat opens before the water temperature reaches 160°F or does not open until after the water temperature reaches 180°F, it should be replaced.

c. Inspection. Inspect adapter for deterioration. Inspect elbow (housing) for cracks and thread for damage.

d. Installation. Reverse procedure in *a* above, using a new gasket between the elbow and the cylinder head. Make sure split in adapter aligns with bypass hole in elbow.

Section VIII. ELECTRICAL SYSTEM (GROUP 06)

56. General

The electrical system consists of six basic circuits; starting, charging, ignition, horn, instrument, and lighting. The units of the various circuits are connected in a 12-volt negative-ground, single-wire system. When repairing or replacing wiring, refer to wiring diagram (fig. 22). This section covers second-echelon maintenance and repair of various components of the electrical system.

57. Generator

a. Removal (fig. 23).

(1) Disconnect and tag leads at generator lead terminals.

(2) Remove adjustment screw, nut and washer at strap.

(3) Remove mounting screws at underside of generator. Disengage generator from fan belt and remove generator.

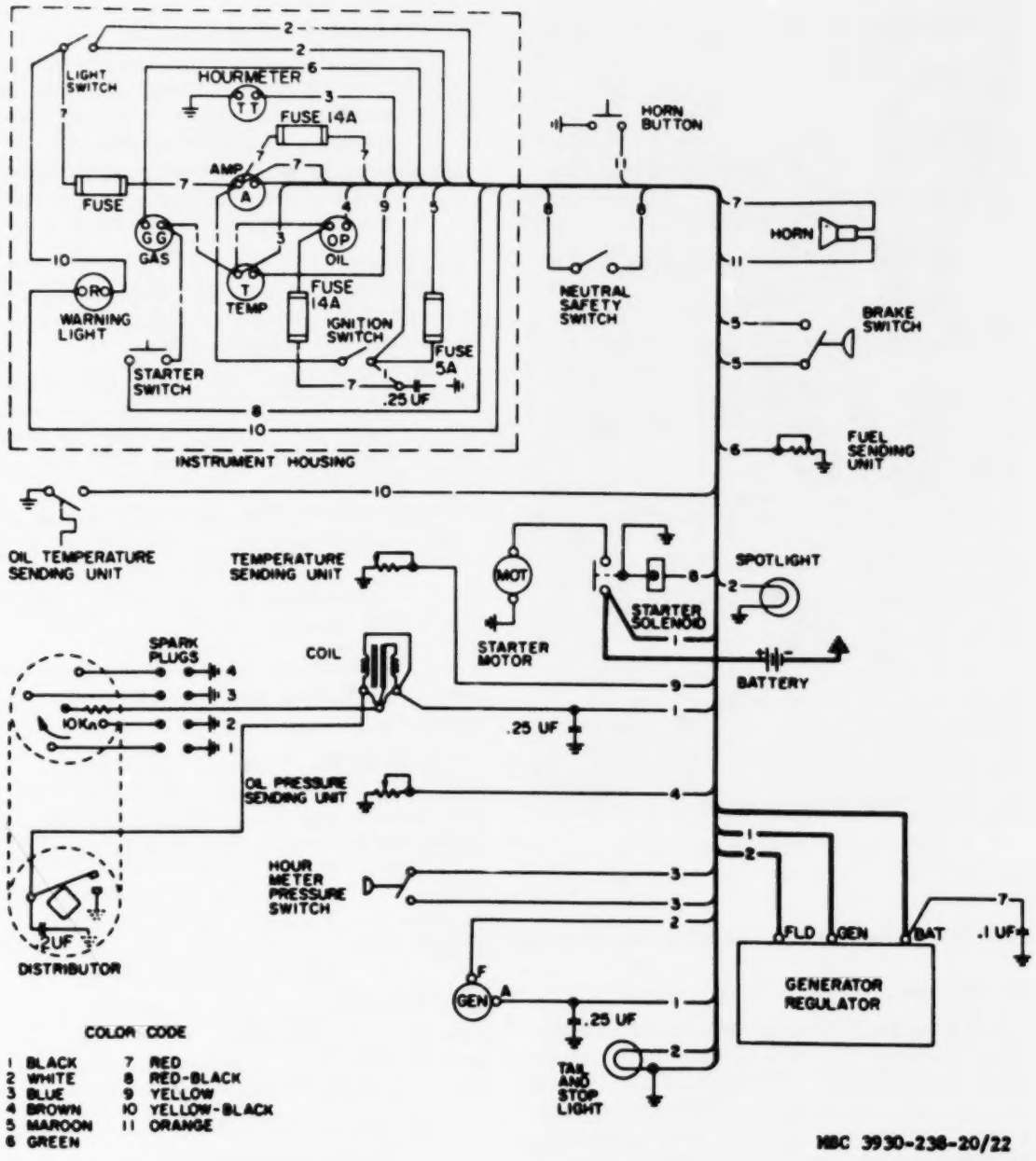


Figure 22. Wiring diagram.

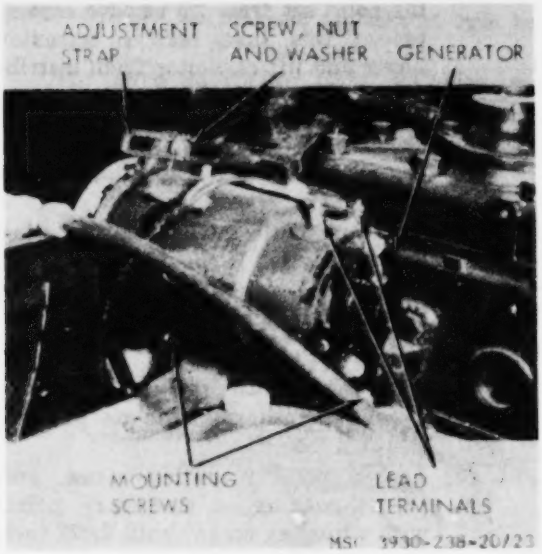


Figure 23. Generator, installed.

b. Installation.

(1) Reverse *a* above, tightening generator belt to ½ inch deflection under thumb pressure, midway in long span.

(2) Repolarize generator, after all electrical connections have been made, by briefly shorting together the BAT and GEN terminals of the generator regulator with a jumper wire, or a screwdriver blade, just long enough to cause a spark.

58. Generator Regulator

a. Cutout Relay Test.

(1) Disconnect lead at regulator F terminal and connect 0.25 ohm 25 watt variable resistor in series with F terminal and lead (fig. 24).

(2) Connect voltmeter from GEN terminal to ground on frame. Remove regulator cover and operate engine at fast idle.

(3) Increase field resistance until cutout relay opens, then decrease it until points close. Observe voltage at which points close (refer to par. 7). Perform step *b* below next.

b. Voltage Regulator Test.

(1) Disconnect battery lead from BAT terminal (fig. 25) of regulator and connect 1½ ohm 25 (or more) watt resistor between the BAT terminal and ground on frame.

(2) Move voltmeter lead from GEN to BAT terminal. Operate generator at charging speed for 15 minutes.

Note. Disregard amount of current flowing during this test: however, it is important that the ignition be the only electrical load on the system at this time.

(3) Cycle the generator with the variable resistor, to a 4 volt reading at the GEN terminal, then cut out the resistor and note voltage reading at the BAT terminal. Compare with values in par. 7.

c. Current Regulator Test.

(1) Connect ammeter into charging circuit, as in figure 26.

(2) Turn on all accesory load (lights) and connect an additional load across the battery (such as a carbon pile or bank of lights) so as to drop the system voltage approximately one volt below the voltage regulator setting.

(3) Operate generator at specified speed for 15 minutes with cover in place. (This stabilizes operating temperature.)

(4) Cycle generator with variable resistor and note current setting.

d. Removal.

(1) Disconnect and tag leads at BAT, GEN and F terminals of regulator (fig. 27).

Caution. **Lead at BAT terminal is a hot lead. Do not let it contact the vehicle frame.**

(2) Remove three screws, nuts and washers, and remove regulator and radio suppression capacitor.

e. Installation. Reverse procedure in *d* above, connecting capacitor lead to the regulator BAT terminal.

59. Starter

a. Removal.

(1) Disconnect battery cable (fig. 28), first at battery, then at starter terminal. Disconnect switch lead at terminal.

(2) Remove three nuts and washers secur-

ing starter to engine and remove starter to engine and remove starter.

b. Installation. Reverse *a* above.

60. Distributor

a. Removal.

(1) Loosen screw at distributor primary terminal (fig. 29) and remove primary circuit lead-in wire.

(2) Snap clips from distributor cap and lift cap from distributor. Do not remove wires from cap.

(3) Chalk mark edge of distributor to indicate location of rotor tip before removal, loosen clamp screw and lift out distributor.

Note. Do not turn engine crankshaft until distributor is reinstalled.

b. Repair.

(1) If contacting area of points (fig. 30) is slightly burned or pitted, clean area with a few strokes of a point file. Do not try to remove all roughness, or dress the points down smooth; only remove scale or dirt. Do not use sandpaper or emery to dress the points.

(2) To remove points, remove the point mounting screw and loosen the point spring nut enough to permit lifting the point set free. To remove capacitor at this time remove capacitor screw and lift capacitor from distributor.

Note. Do not replace capacitor unless it is believed to be defective.

(3) Install points and capacitor by reversing (2) above.

(4) Test automatic advance by twisting cam clockwise. It should turn against spring tension, and return by spring tension to its original position.

c. Adjustment.

(1) Turn cam until rubbing block on moving point arm rests on peak of one cam lobe.

(2) Loosen point mounting screw, and adjust position of stationary point, with adjusting screw, until 0.022 inch leaf feeler gage will just enter gap.

(3) Tighten mounting screw.

d. Installation.

(1) Position rotor so tip points to chalk mark made in *a*(3) above, and replace distributor in engine. Connect primary lead wire.

(2) Tighten distributor clamp screw only enough to put a drag on distributor body if turned. Turn engine until D-C

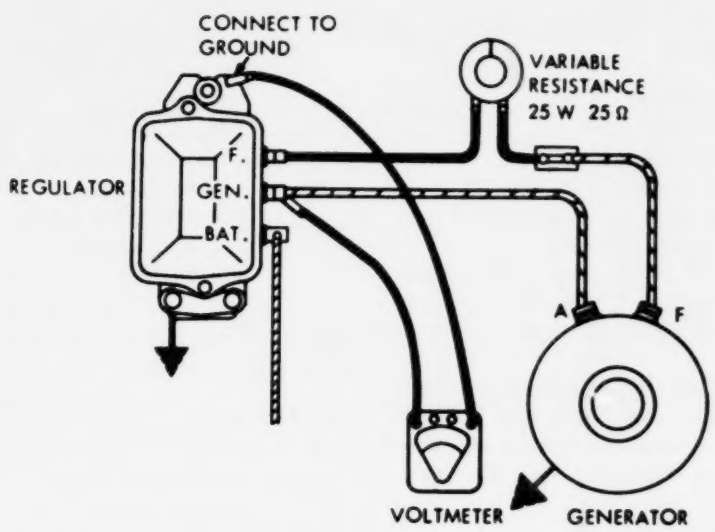


Figure 24. Cutout relay test setup.

mark on flywheel appears at hole in flywheel housing.

(3) Turn distributor body clockwise until points are definitely closed.

(4) Turn on ignition, remove coil wire from center of cap and hold it about ¼ inch from cylinder head.

(5) Turn distributor slowly counterclockwise, stopping at exact point at which coil wire sparks. Tighten clamp screw,

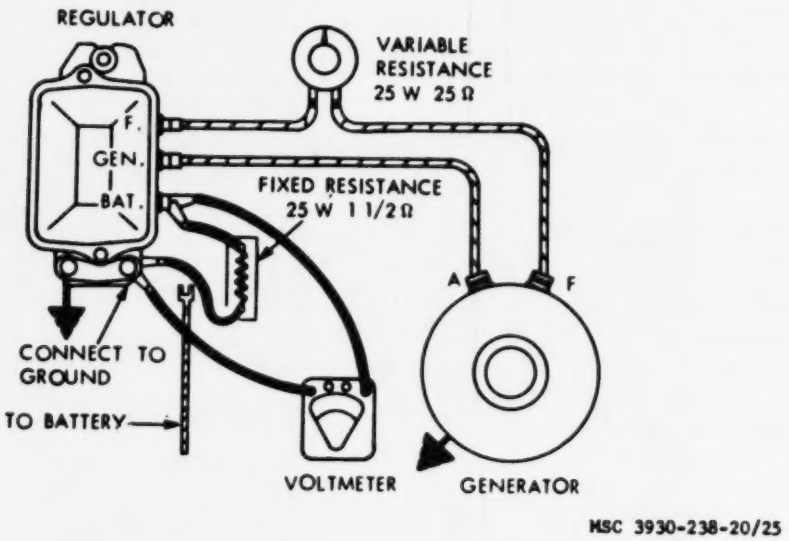


Figure 25. Voltage regulator test setup.

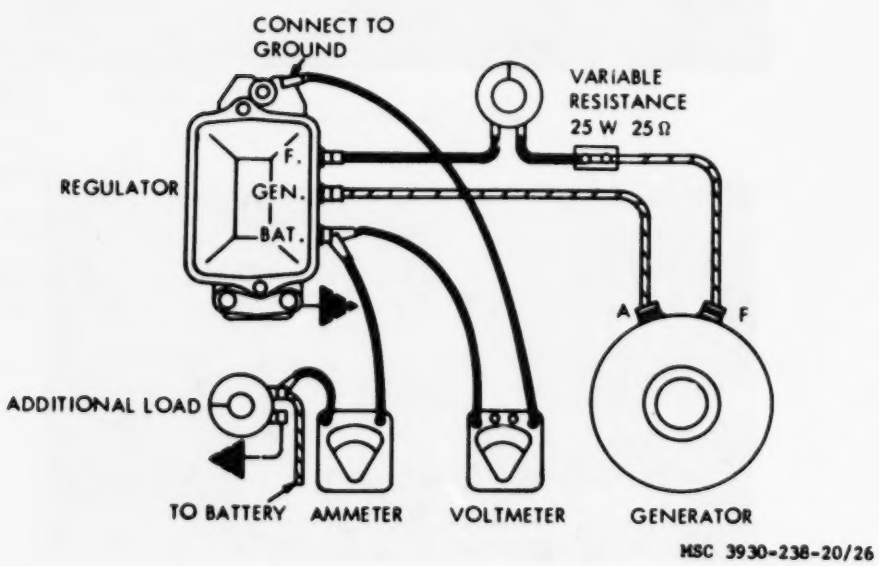


Figure 26. Current regulator test setup.

turn off ignition and reinstall distributor cap and coil wire in cap.

61. Coil, Capacitor, Spark Plugs

a. Coil and Capacitor Removal.

(1) Disconnect primary and secondary leads at coil, and capacitor lead to positive coil terminal (fig. 31).

(2) Remove screws and washers holding coil and capacitor to engine, and remove coil and capacitor.

b. Coil and Capacitor Test. Test coil on Coil Tester, Federal Stock No. 4910–092–7928 or approved equivalent.

c. Coil and Capacitor Installation. Reverse *a* above.

d. Spark Plug Removal. Remove spark plug cables from plugs, blow all loose dirt from spark plug area and unscrew spark plugs.

e. Spark Plug Cleaning and Test.

(1) Clean spark plugs with an abrasive

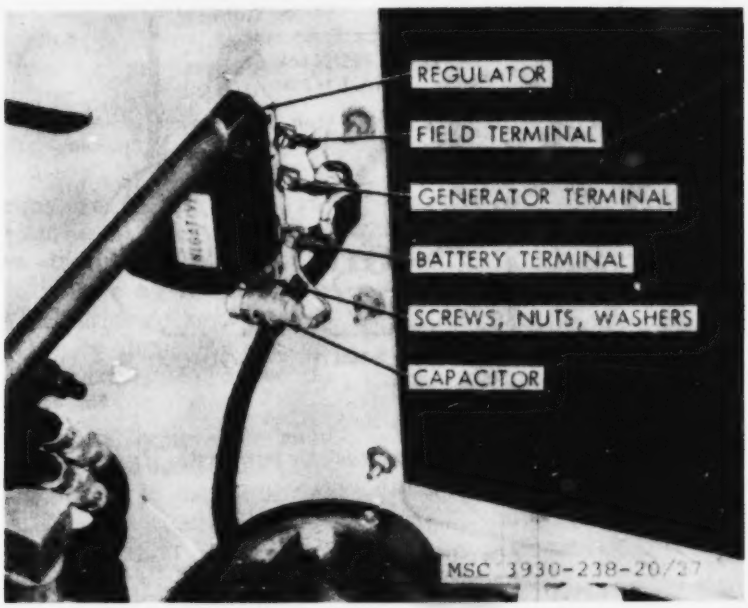


Figure 27. Regulator, installed.

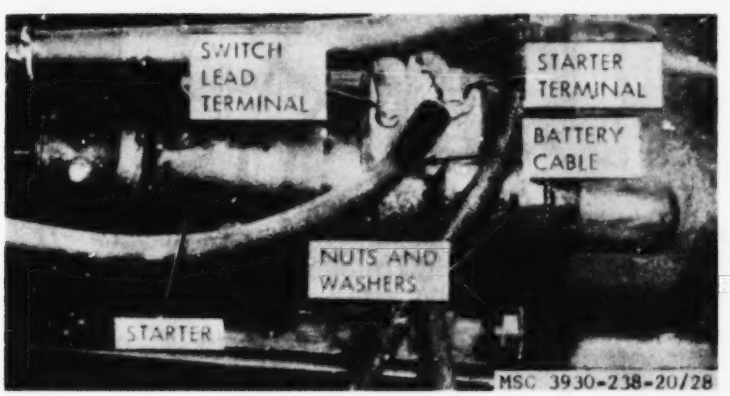


Figure 28. Starter, installed.

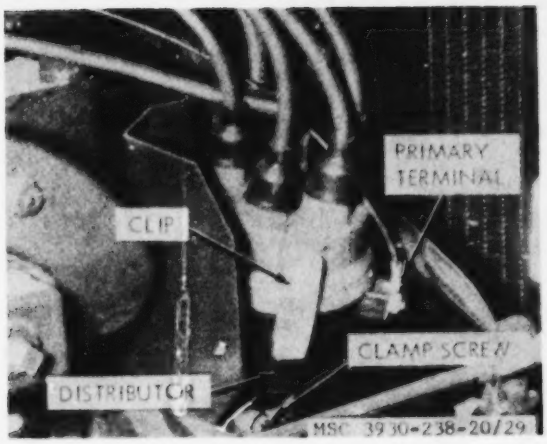


Figure 29. Distributor, installed.

type spark plug sand blaster. After cleaning remove all traces of abrasive from inside spark plug.

(2) Test spark plugs with an approved spark plug tester.

f. Spark Plug Adjustment. After cleaning, adjust gap to 0.025 inch by bending side electrode only.

g. Spark Plug Installation. Reverse *d* above, installing plugs to 25 to 30 foot pounds torque.

62. Instrument Housing

a. Identification. The instrument housing assembly shown in figure 32 is mounted on the truck steering column. It incorporates the following items:

(1) The engine operation hourmeter to which reference is made in determining when periodic service operations are due.

(2) The light switch which controls the spotlight and taillight.

(3) The ammeter which indicates the rate at which the battery is being charged or discharged.

(4) The engine oil pressure gage which indicates lubricating oil pressure.

(5) The ignition switch. In addition to controlling the ignition system, this switch energizes the instruments and indicator, and the starter circuit up to the starter switch.

(6) The engine temperature gage which indicates the engine coolant temperature.

(7) The starter switch which controls the starter motor.

(8) The fuel level gage.

(9) The temperature warning light which

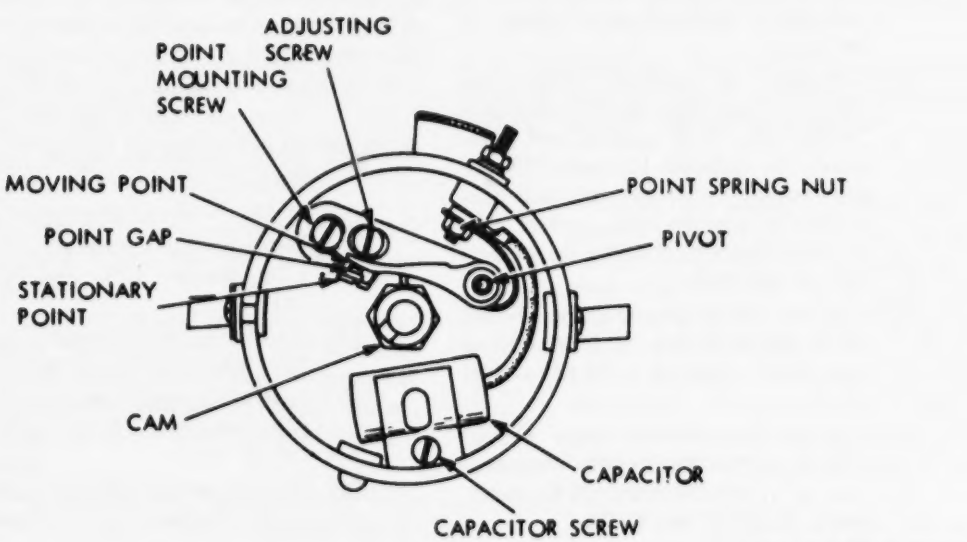


Figure 30. Distributor, cap removed.

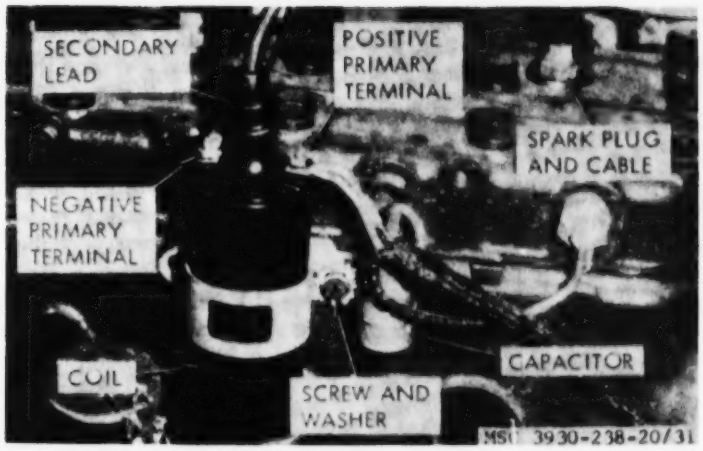


Figure 31. Coil, capacitor, spark plugs.

lights to show high transmission fluid temperature.

b. Inspection.

(1) Inspect lead wires to switches and instruments for continuity and security of attachment at terminals.

(2) Check operation of instruments and, where applicable, transmitters, for following indications:

(*a*) Engine hourmeter (fig. 32) to indicate time during which engine is operating, in hours and tenths of an hour.

(*b*) Ammeter to indicate slight discharge when lights and ignition are turned on, with engine not running. To indicate charge with engine running. Charge rate will normally be higher with partly discharged battery, decreasing as battery is charged.

(*c*) Engine oil pressure gage should show 25 to 35 psi at 1600 engine rpm when warm, 5 to 10 psi at idle speed.

(*d*) Engine temperature gage should reflect increasing engine temperature as engine warms up, to maximum of 175°F to 185°F.

(*e*) Fuel gage will reflect amount of gas in tank.

(*f*) Transmission warning light will light only when high transmission oil temperatures occur. Check that lamp is operational by grounding terminal of transmitter on transmission (fig. 22) with jumper lead. Lamp should light at this time.

(3) Check switch continuity. With switch closed (on), voltage reading across switch terminals must be less than 0.1 volt.

c. Removal of Components. In all cases below, remove and tag leads first.

(1) *Instrument cluster removal* (1, fig. 33). Remove nut (16) and washer (17). Lift out cluster from case (20).

(2) *Time totalizing meter (hourmeter)* removal. Remove nut (10) and washer (9), and remove meter (2).

(3) *Warning light removal.* Remove nut (13), washer (12) and lift out light (3).

(4) *Light switch removal.* Remove nut (7), washer (8) and switch (11).

(5) *Ignition switch removal.* Remove nut (4), washers (5, 6, and 14), and switch (15).

(6) *Starter switch removal.* Remove nut (21), washer (19), and switch (18).

d. Installation of Components. Reverse the procedure for the removal of the component in *c* above.

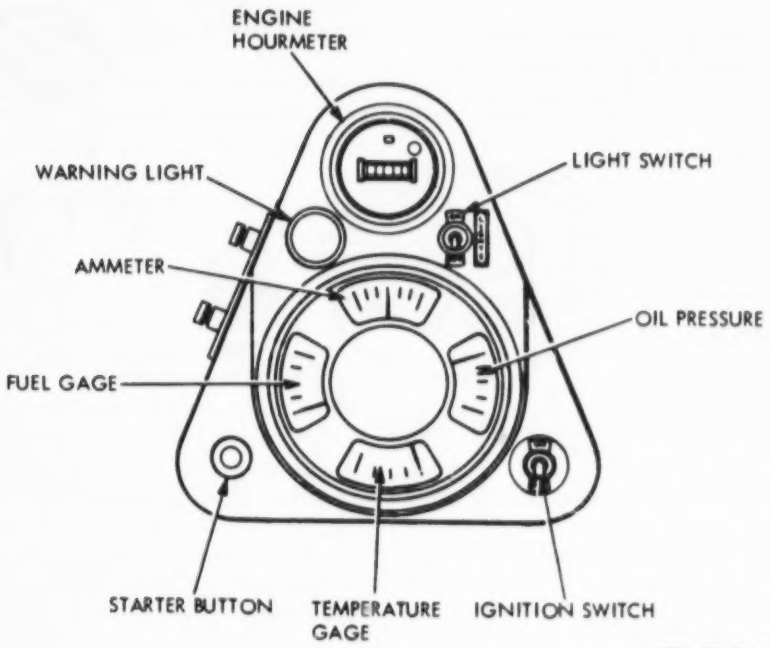


Figure 32. Instrument housing.

63. Battery and Cables

a. Removal.

(1) Disconnect ground and starter cables at battery. If necessary use a puller to lift cable terminals from posts with a vertical pull. Do not twist or pry terminals from post.

(2) Disconnect ground cable from frame, and starter cable from starter (fig. 28).

(3) Loosen nuts and washers (fig. 34) holding strap, and lift battery clear of truck.

Caution: **Avoid contact with any liquid on the battery. It will probably be electrolyte, which can produce skin burns and damage clothing if not rinsed off quickly with clear water.**

b. Cleaning.

(1) Wash battery by flushing freely with water. Use brush if necessary to remove crusted deposits. Brush terminal posts to bright finish without removing metal.

(2) Wash battery cables in hot water to remove dirt and corrosion. Wire brush inside of battery terminals to bright finish.

c. Installation. Reverse *a* above. Tighten battery strap nuts only tightly enough to hold battery snugly. Do not over tighten.

d. Test.

(1) Remove cell caps, and test specific gravity of electrolyte in each cell with battery hydrometer. All cells should read within 10 points of each other. Reading of 1.280 indicates full charge; 1.220 indicates about 50% charged; 1.160 indicates practically complete discharge. Variations in readings among cells indicate the low reading cells are defective, and battery must be replaced.

Note. Readings above apply at electrolyte temperature of 80° F. At different temperatures, add .004 to reading for each 10° F. above 80° F; subtract .004 from actual reading for each 10° F. below 80° to obtain value

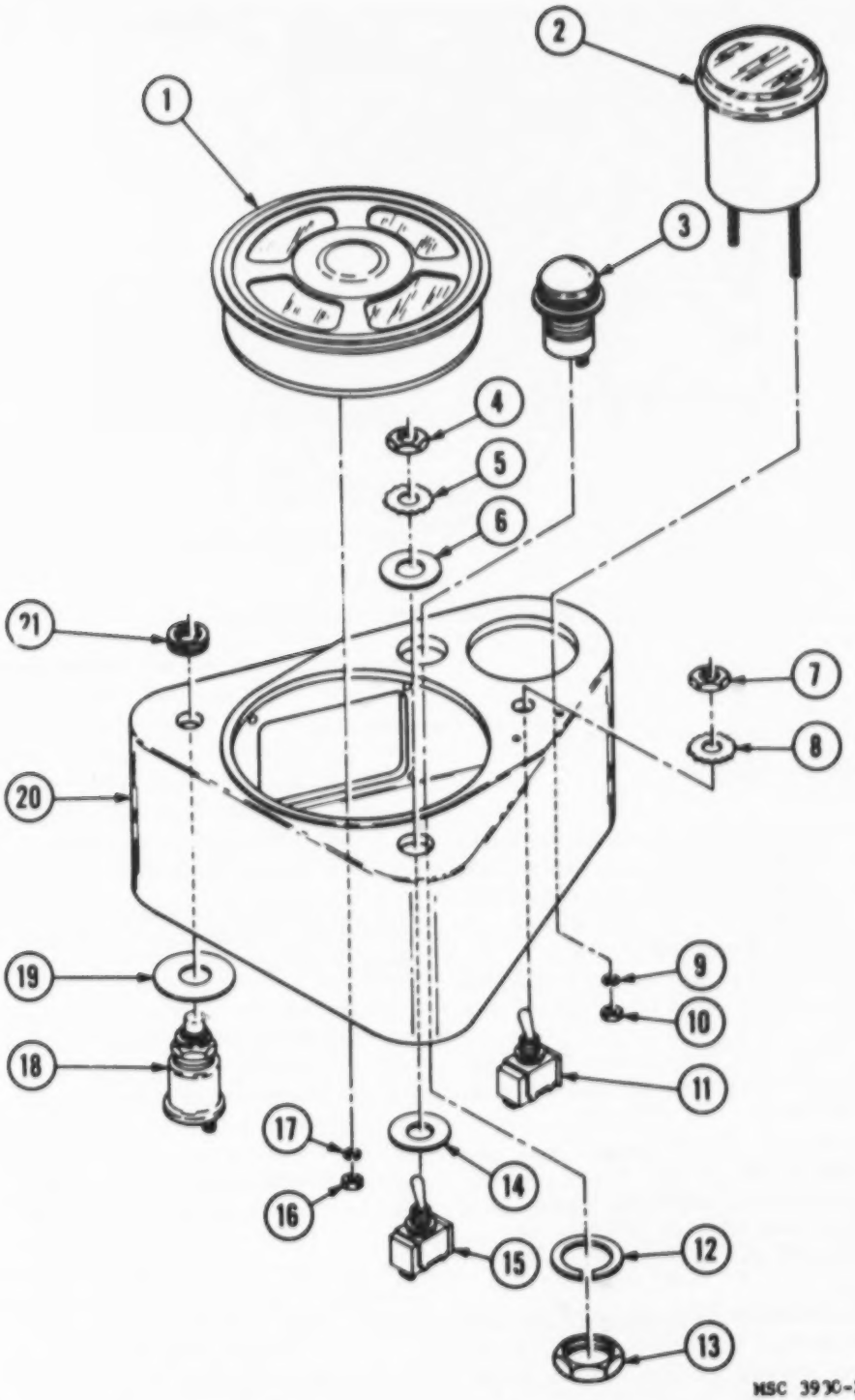


Figure 33. Instrument housing, exploded view.

for comparison with figures given. In case of chronic low state of charge, refer condition to higher maintenance for charging system service.

(2) With fully charged battery installed, test cables and connections as follows:

(*a*) Contact positive battery post (do not touch cable terminal) with positive lead of voltmeter calibrated in tenths of a volt. Contact negative voltmeter lead to starter terminal of starter.

(*b*) Crank engine. Note voltmeter reading while cranking. Any reading in excess of 0.2 volt indicates electrical resistance due to a bad cable or connection.

(*c*) Repeat (*a*) and (*b*), except contact ground on engine with voltmeter positive lead, and voltmeter negative lead touching battery negative post. Voltmeter reading greater than 0.2 volt indicates bad cable or connection.

64. Chassis Wiring Harness Repair

If failure occurs in one of the wires in the harness, and general damage to the harness has *not* occurred, as would be the case if one wire burned, repair as follows:

a. Disconnect defective wire at both ends and clip off where it enters harness.

b. Select suitable length of correct gage and type wire for replacement. All wires are 14 gage except:

(1) Generator A terminal to regulator A terminal.

(2) Regulator B terminal to ammeter.

(3) Ammeter to starter terminal. These three wires are 10 gage wire.

c. Install wire terminals, equivalent to those used on the original wire, dress the replacement wire neatly along the outside of the loom parallel to the original wire (tie with light cord at four inch intervals) and connect new wire.

Section IX. BRAKES (GROUP 12)

65. Brake Shoes (Parking Brake)

a. Adjustment.

(1) Fully release parking brake lever (TM 10–3930–238–10), and turn adjustment knob at top of brake handle counterclockwise to slack off linkage adjustment.

(2) Loosen nut on brake shoe stop screw (fig. 35) and adjust screw until lining of both shoes contacts brake drum.

(3) Back off brake shoe stop screw two turns and tighten nut to hold adjustment.

(4) Apply parking brakes (TM 10–3930–238–10) and tighten adjustment knob snugly, to the extent a firm push is required to release the parking brake.

b. Removal.

(1) Remove twelve capscrews (fig. 35 inset) and remove as much of propeller shaft as necessary to get access to nut holding on parking brake drum.

(2) Remove drum retaining nut and pull off drum.

(3) Loosen brake shoe stop screw nut, and back off screw adjustment fully.

(4) Remove retaining rings and pins, and remove brake shoes.

c. Installation. Reverse *b* above, and adjust brakes as in *a* above.

66. Master Cylinder

a. Removal.

(1) Unscrew bolt, fitting and stop light

1	Instrument cluster	8	Washer	15	Ignition switch
2	Time totalizing meter	9	Washer	16	Nut
3	Warning light	10	Nut	17	Washer
4	Nut	11	Light switch	18	Starter switch
5	Washer	12	Washer	19	Washer
6	Washer	13	Nut	20	Instrument case
7	Nut	14	Washer	21	Nut

Figure 33—continued

switch (fig. 36) from master cylinder. Do not disassemble this group of parts.

(2) Remove cotter pin and clevis pin from push rod yoke, remove two nuts and washers, through bolts, and master cylinder.

b. Installation.

(1) Reverse *a* above.

(2) Fill master cylinder with brake fluid (refer to LO 10–3930–238–20).

(3) Bleed air from brake hydraulic system, using procedure appropriate for brake bleeding equipment available.

(4) Loosen jam nut on push rod clevis, and adjust effective length of push rod to give between 3/8 inch and 5/8 inch free travel of brake pedal before resistance is felt. Tighten jam nut.

67. Brake Wheel Cylinder

a. Removal.

(1) Remove wheel, hub and drum (par. 69).

(2) Disconnect brake actuating tube, elbow and adapter and gasket (fig. 37). Disconnect cylinder bleeder tube from wheel cylinder.

(3) Remove two screws and washers, spread upper ends of brake shoes apart to permit removal of wheel cylinder, and remove wheel cylinder.

b. Installation.

(1) Reverse *a* above.

(2) Bleed brake system, using procedure appropriate for brake bleeding equipment available.

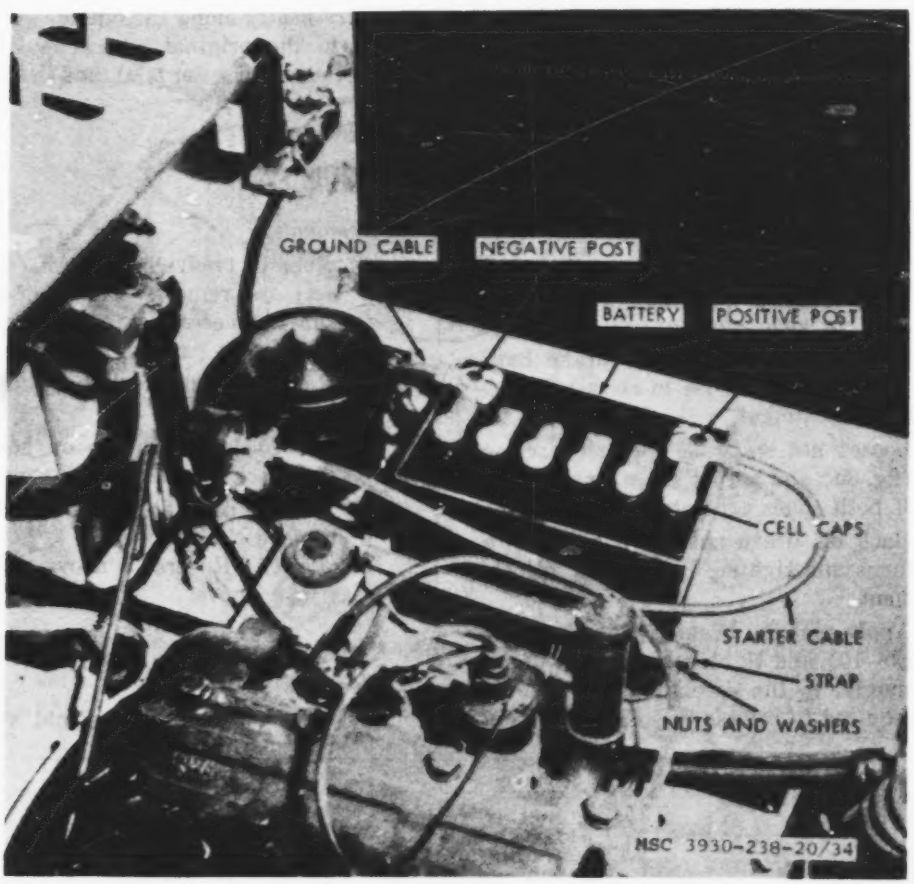


Figure 34. Battery and cables.

68. Pedal and Linkage

a. Removal.

(1) Remove five screws, nuts and washers, and remove floorboard.

(2) Remove pedal nuts and washers, and pedals (fig. 38). Remove cotter pin and pin from master cylinder clevis. Do not unscrew clevis from master cylinder unnecessarily to avoid disturbing pedal adjustment excessively.

(3) Remove inching valve adjustment screw and spring, brake lever mount-

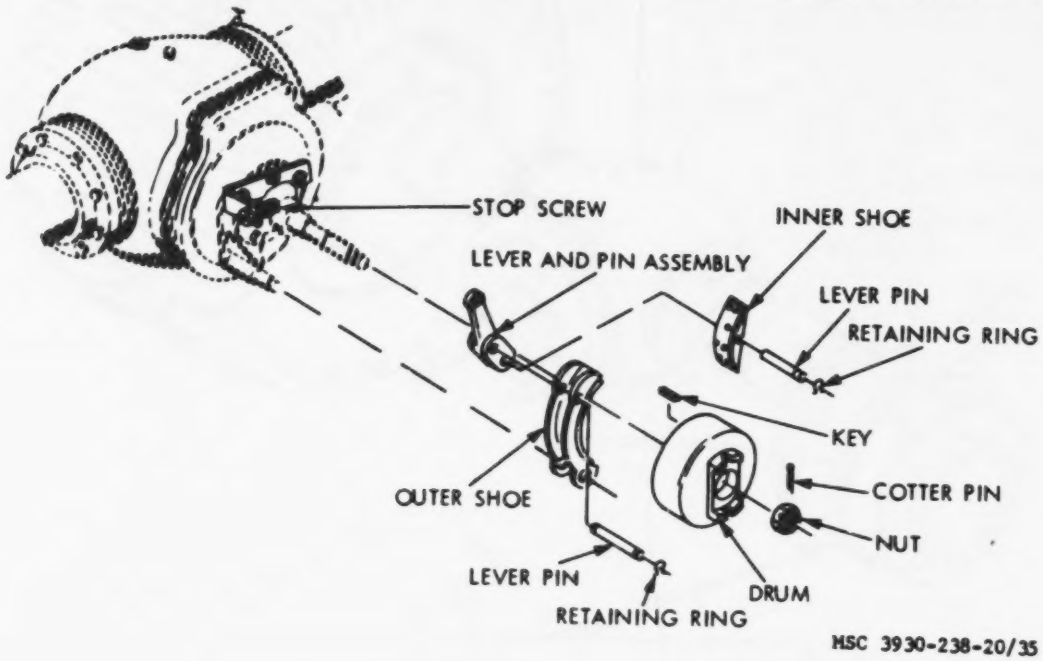


Figure 35. Parking brake, partly exploded view.

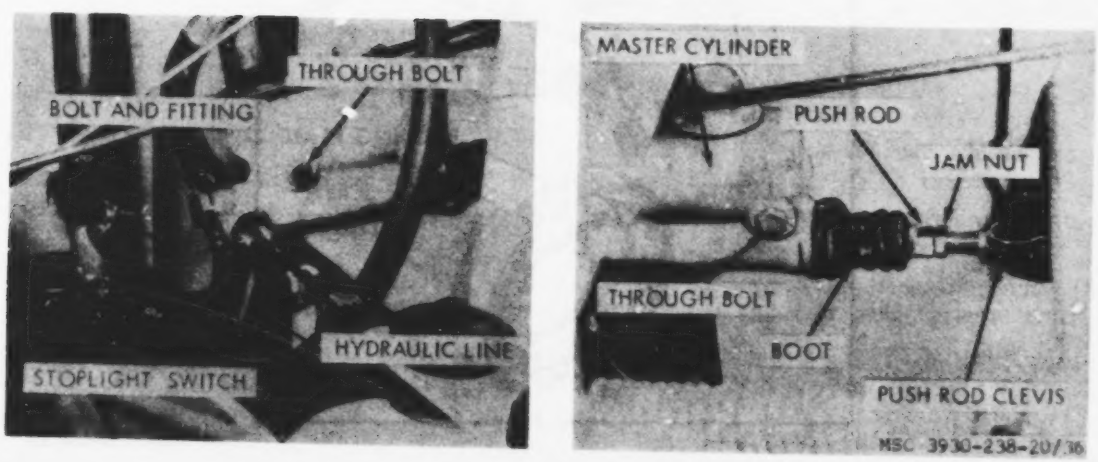


Figure 36. Master cylinder, installed.

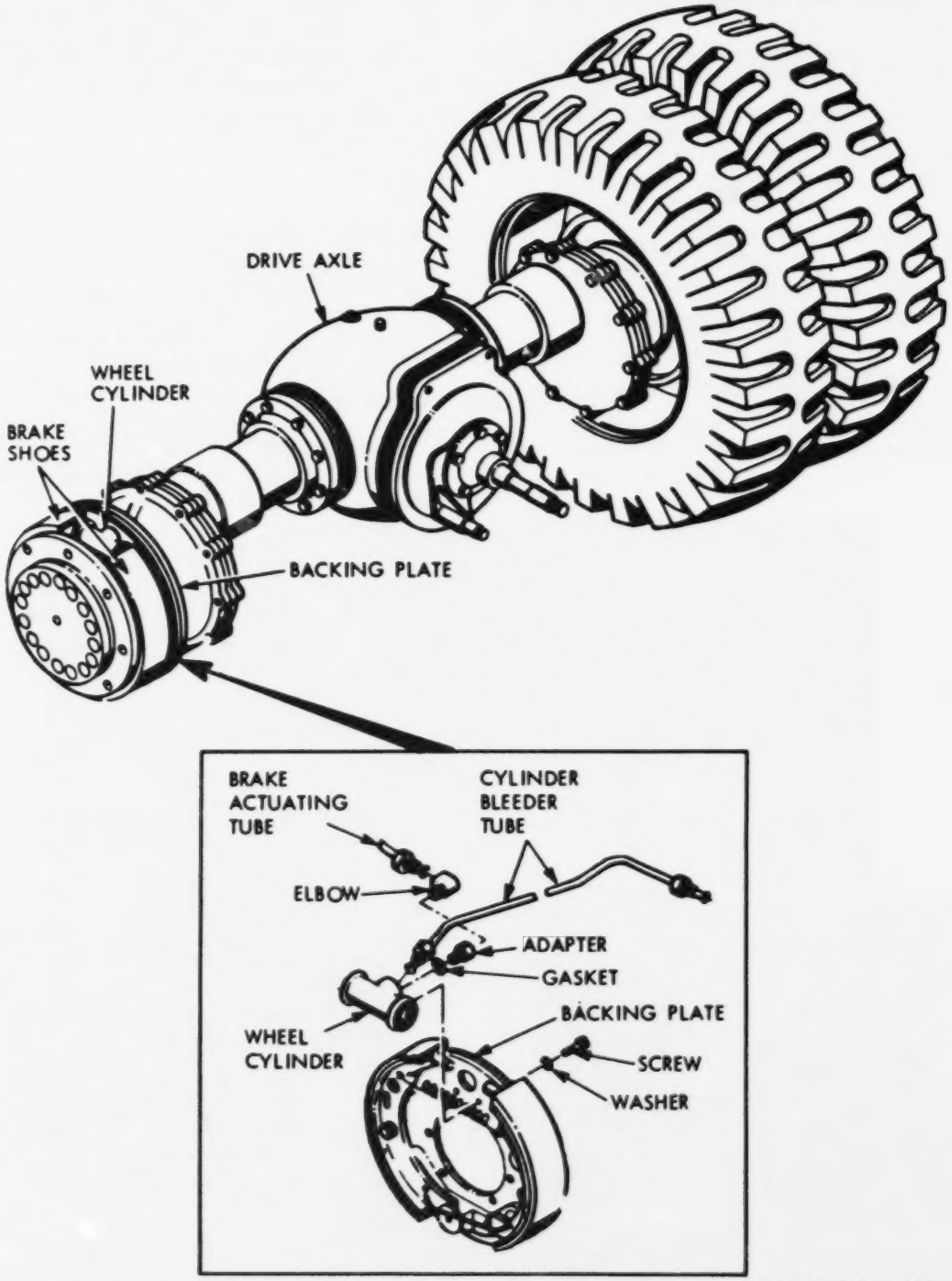


Figure 37. Drive axle and brakes, partly exploded view.

ing screws and bearings, and brake lever.

b. Installation.

(1) Reverse *a* above.

(2) Perform procedure in par. 66*b*(4).

(3) With drive wheels raised off floor and forward clutch engaged, turn adjusting nut, or add washers, until no movement of the inching spool is detected at all engine speeds.

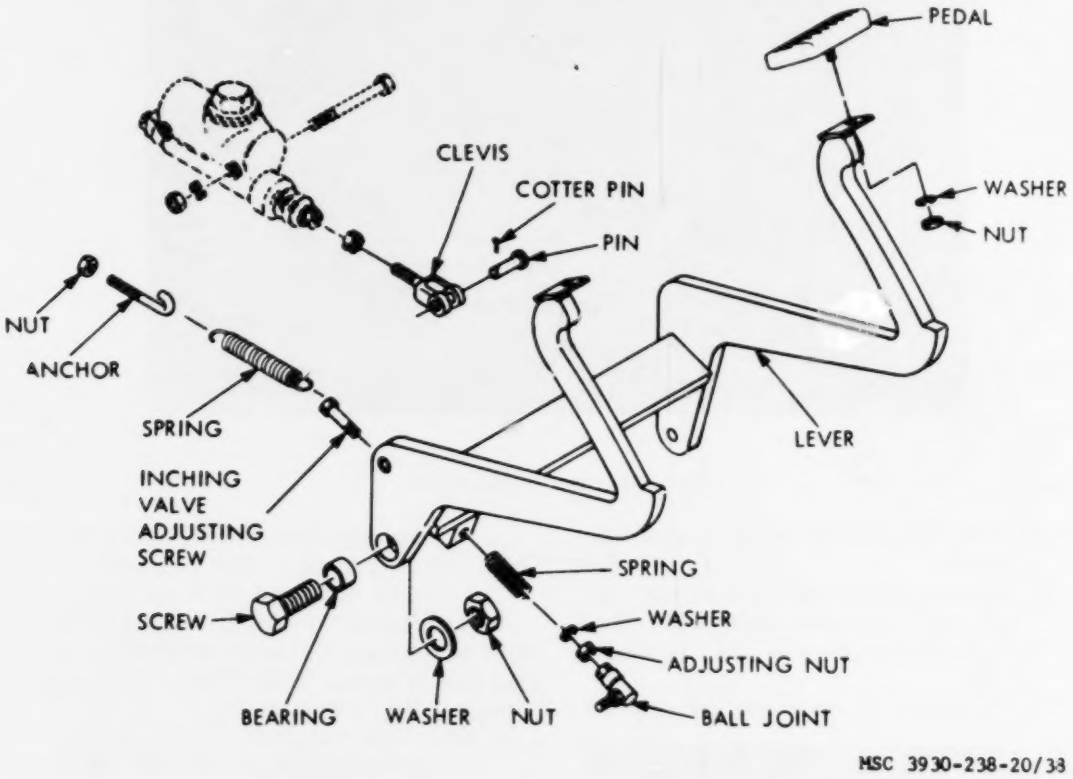


Figure 38. Brake pedals and linkage, exploded view.

Section X. WHEELS (GROUP 13)

69. Wheel Assembly

a. Removal of Drive Wheels.

(1) Raise front of truck so drive wheels clear floor.

(2) Remove wheel bolts (fig. 29), and draw dual wheel, tires and drum from drive axle.

Note. Removal may be easier if weight of wheel is supported by a wheeled floor jack or dolly.

b. Installation of Drive Wheels. Reverse *a* above.

c. Removal of Rear Wheels.

(1) Raise truck so rear wheels are off ground.

(2) Completely deflate tire on wheel to be removed.

(3) Remove wheel mounting nuts (fig. 40) and draw wheel free of truck.

d. Installation of Rear Wheels. Reverse *c* above.

70. Tires and Tubes

a. Front (Drive) Tire Removal.

(1) Remove drive wheel (par. 69*a*).

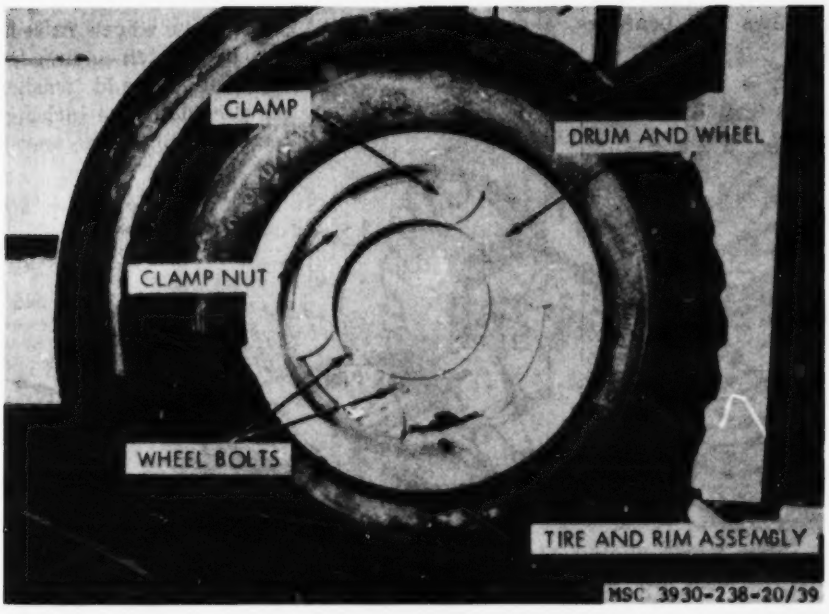


Figure 39. Drive wheel removal.

(2) Fully deflate tires on drive wheel removed.

(3) Remove clamp nuts and clamps (fig. 39) and separate drum and wheel from spacer and rim and the assemblies.

(4) Using service equipment designed for this operation, remove rim ring from rim (fig. 41). Pull rim free, and remove flap and tube from tire.

Figure 40. Rear wheel removal.

b. Installation. Reverse *a* above. Inflate tires to 85 psi. Rotate rim while mounting to insure that rim is square with wheel. Torque clamp nuts to 170 to 180 ft lbs.

c. Rear Tire Removal.

(1) Remove rear wheel (par. 69*c*).

Warning: **Be sure tire is fully deflated before proceeding with next step.**

(2) Remove screws, nuts and washers (fig. 42) holding rim halves together, separate rim halves and remove flap, tube and tire.

d. Rear Tire Installation. Reverse *c* above.

e. Tire and Tube Repair.

(1) Repair punctures of tire or tube less than 3/8 inch in greatest dimension by application of a patch on tube, or rubber plug in tire casing puncture.

(2) Refer more extensive damage to higher maintenance echelon.

71. Drag Link

a. Removal. Raise truck. Working from below, remove the cotter pins and nuts (fig.

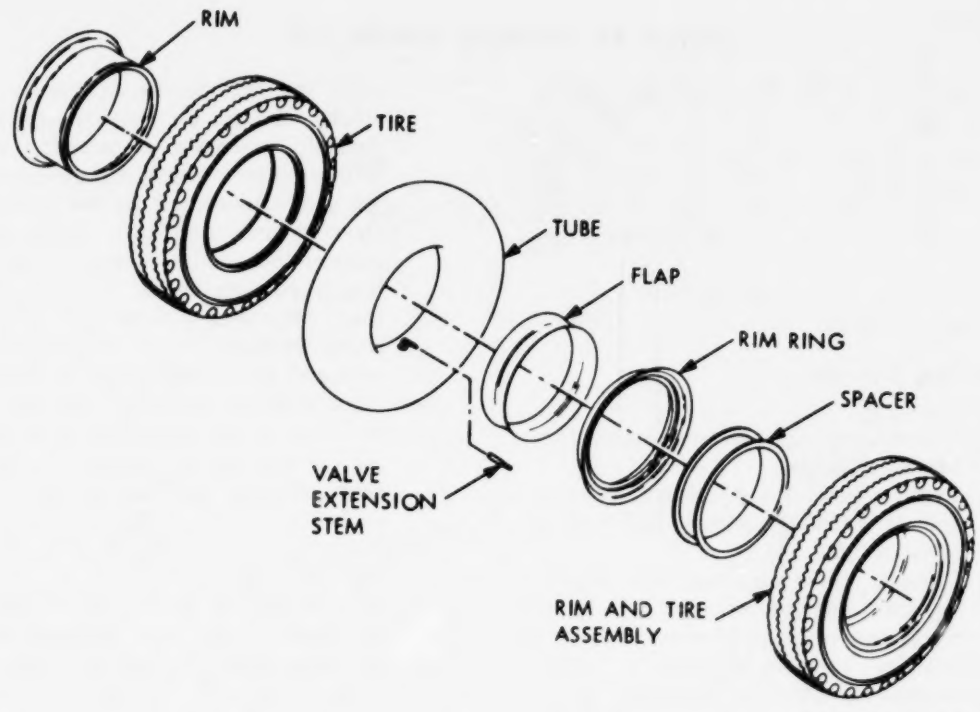


Figure 41. Drive wheel disassembly.

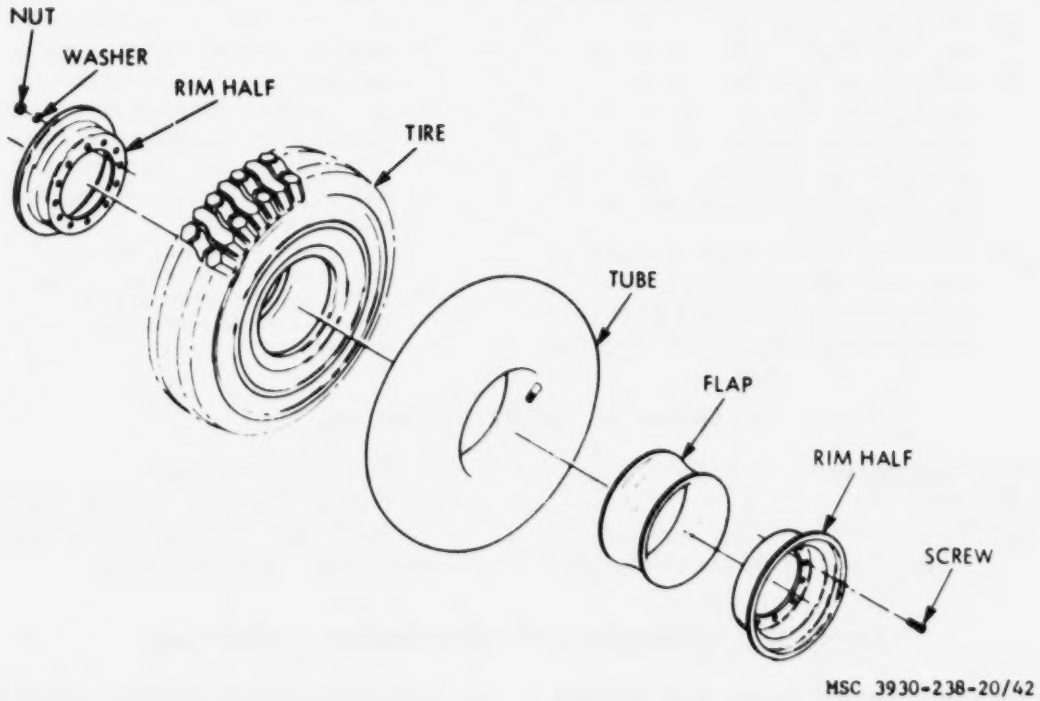


Figure 42. Rear wheels and tires, exploded view.

43) at each end of the drag link and remove the drag link.

b. Repair. Repairs to drag link are limited to replacing defective parts. To replace tie rod end, loosen clamp screw, unscrew tie rod end, install new tie rod end and tighten clamp screw.

c. Installation. Reverse *a* above.

d. Adjustment (par. 72).

72. Steering Cylinder

a. Removal.

(1) Disconnect, cap and tag hoses (fig. 44) at cylinder.

(2) Remove hose clamp holding hoses to cylinder, disconnect drag link end at cylinder (fig. 43).

(3) Remove cotter pins and nuts attaching front and rear ends of cylinder to truck and remove cylinder.

b. Installation. Reverse *a* above.

c. Adjustment of Steering Linkage.

(1) Assemble front tie rod end (fig. 43) on cylinder so that thread engagement is approximately 1½ inches.

(2) When performing adjustments in (3) and (4) below, there should be no restraint on cylinder or pitman arm due to stops on trailing axle. To insure this, rear tie rod end should be removed from steering axle bellcrank, but should be maintained in line with hole in bellcrank.

(3) With drag link in place, turn steering wheel full right with right turn stop screw backed off. Remove tie rod end from steering arm and pull drag link until the cylinder is at the end of stroke. Adjust tie rod end and temporarily assemble in steering arm. Turn stop screw until it touches steering arm. Disconnect tie rod end from steering arm and turn three turns counterclockwise to increase drag link length. Assemble to steering arm. Back off steering arm with steering wheel, turn stop screw one additional turn and lock in position with locknut.

(4) Turn steering wheel full left with left turn stop screw backed off until steering cylinder has extended 11½ inches from adjusted position for right turn, as in (3) above. Bring stop screw in contact with pitman arm and lock in place with locknut.

(5) Adjust rod so that equal angles of steering wheels are obtained when steering wheel is turned from full right to full left. Major adjustment of rod length must be made using only rear tie rod end while rod is threaded into cylinder to make dimension 12¾ inches. Final adjustment may be made by turning rod with rear tie rod end assembled in bellcrank. Do not turn rod more than one turn in either direction or the thread engagement will be below minimum required.

(6) Before final clamping of rod, position cylinder as shown.

Note. After final adjustment, entire linkage and wheels must be stopped only on stop screws. Cylinder should have approximately ¼ inch of stroke left at full right or full left turn.

Section XII. BODY (GROUP 18)

73. Seat Upholstery

a. Removal.

(1) Remove screws, nuts and washers holding backrest to frame (fig. 45), and remove backrest.

(2) Remove nuts and washers fastening seat to seat rails and remove seat.

b. Installation. Reverse *a* above.

Section XIII. HYDRAULIC LIFT COMPONENTS (GROUP 24)

74. Hydraulic Control Levers and Linkage

Inspect as follows:

a. Inspect security of mounting screws and nuts (fig. 46).

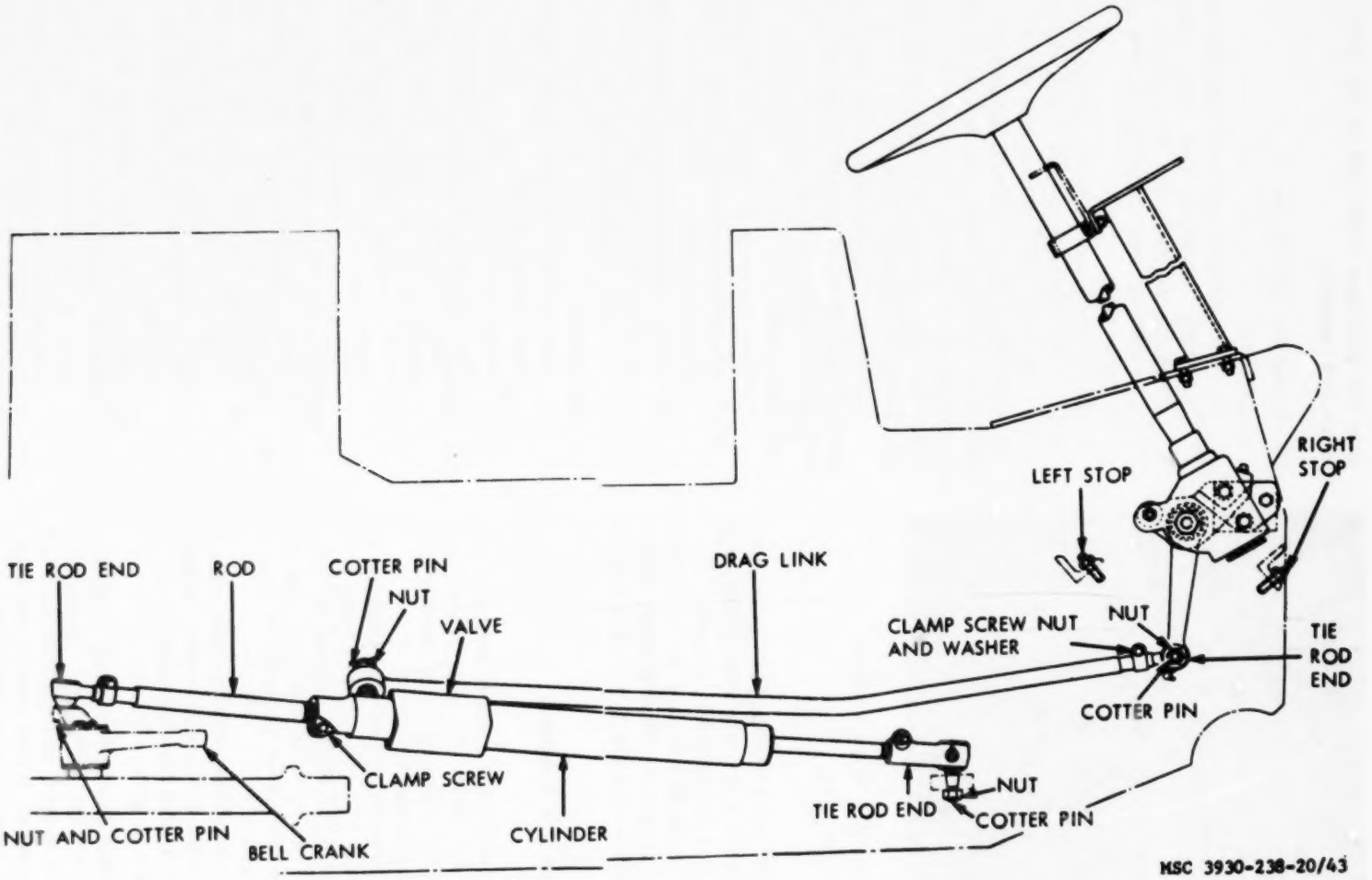


Figure 43. Steering linkage.

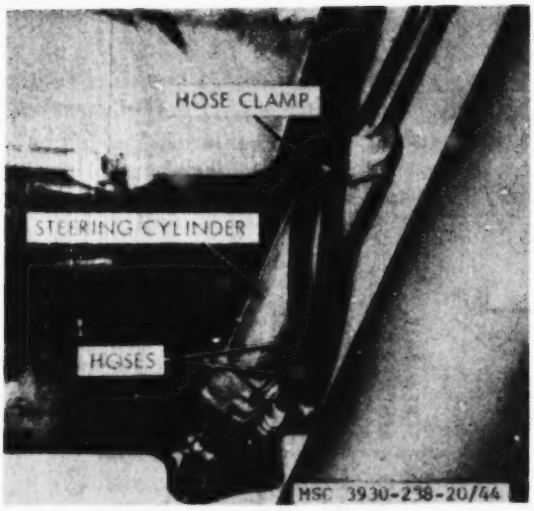


Figure 44. Steering cylinder.

b. Inspect lines and fittings for leaks under pressure. (Operate controls with system pressurized for this inspection.)

c. Inspect levers and linkage for security of attachment, damaged or missing parts. Report any discrepancies found to third echelon maintenance.

75. Hydraulic Tilt Cylinders

a. Removal.

(1) To remove tilt cylinder assembly, disconnect hoses (fig. 47) from the tilt cylinder. Tag hoses for position and ease of reassembly.

(2) Remove four screws and washers, releasing two plates. One plate is located at the forward end of the cylinder, one upright assembly, and the other on frame assembly at rear of cylinder.

(3) Remove plates. Grasp cylinder firmly and pull shafts from their position. Lift tilt cylinder assembly from vehicle.

b. Installation. Position rear end of cylinder in location provided on frame. Slide shaft through frame bracket and cylinder, and lock in place with plate. Install screws and washers to secure plate. Follow this same procedure for attaching front end of tilt cylinder to upright assembly.

76. Hydraulic Lift Chain

a. Removal.

(1) With carriage and fork assembly completely bottomed (fig. 48), release chains at hydraulic lift cylinder by removing two adjusting screws and four nuts.

(2) Lift off load backrest, and reach behind carriage unhook chains at lift carriage. Pull chains free of unit.

b. Cleaning. After removal clean chain by soaking in SD, at the same time scrubbing with a wire brush to remove encrusted lubricant. Dry with clean dry cloths, or dry compressed air. Lubricate by soaking in OE 10.

c. Inspection. Inspect chain for worn or damaged side plates or link pins, damage from lack of lubrication or rust.

d. Installation.

(1) Feed chains over rollers of crosshead assembly and hook in position on carriage assembly.

(2) Install adjusting screws through holes provided on lift cylinder and install four nuts on adjusting screws.

e. Adjustment.

(1) With no load on forks move forks to their extreme width.

(2) Lower forks completely.

(3) Move upright to vertical position.

(4) Turn the nuts up on the adjusting screws as far as threads will allow.

(5) Fork to floor clearance will range from 0 to ¾ inch, depending on tire wear and machine tolerances.

(6) Raise the inner rail assembly to its fullest height and check the clearance between the inner rail stops and the outer rail stop blocks. If the stop blocks are touching, readjust the nuts until a clearance of at least ⅛ inch is obtained.

(7) Adjust nuts until deflection is equal with the same tension applied to each chain at the same height. Keep nut and jam nut as close to end of screws as possible and still obtain above adjustments. This will allow lowest pos-

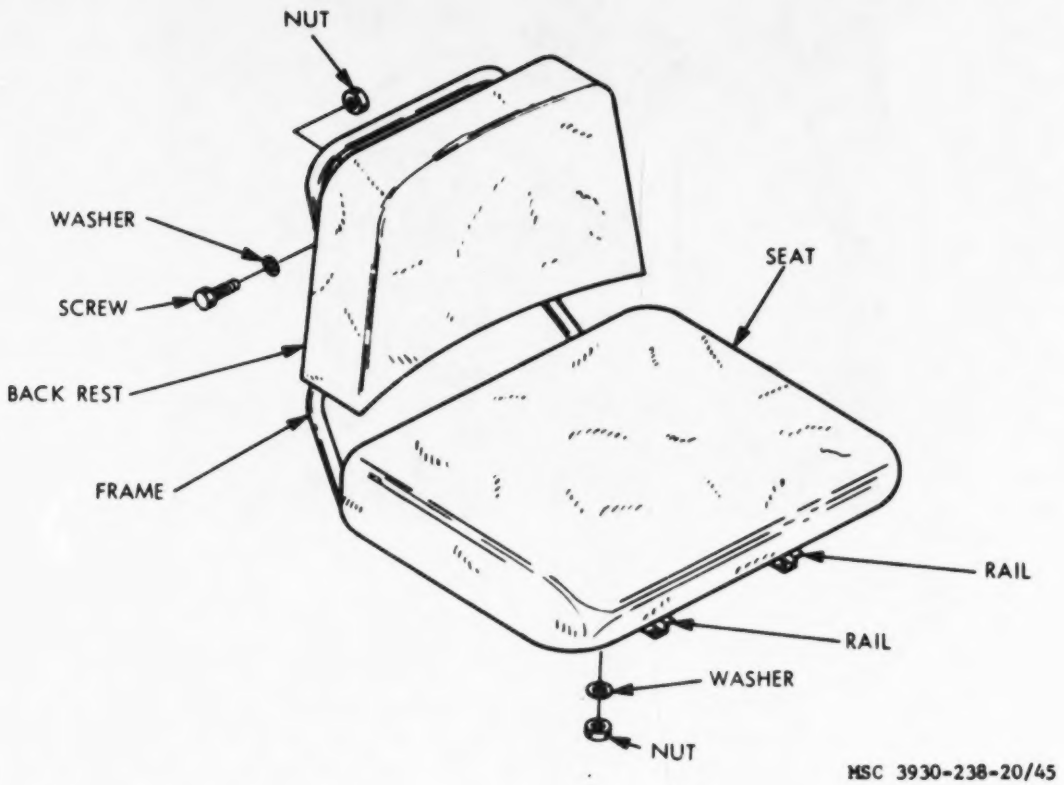


Figure 45. Seat upholstery.

sible position of forks. Tighten jam nuts.

77. Hydraulic Oil Tank

a. Removal.

(1) Raise truck to permit removal of hydraulic oil tank from beneath truck.
(2) With truck lift lowered and tilted back, remove drain plug (fig. 49) and drain oil into a container.
(3) Disconnect all tubing at tank and filter flange.
(4) Remove four nuts, washers, and screws. Lower tank from truck.

b. Cleaning.

(1) Remove four screws and washers. Lift off flange and gasket.
(2) Lift out element and tube.
(3) Wash all parts removed from tank in SD, and dry with dry compressed air.
(4) Flush interior of tank with SD, and drain dry. Be sure no SD is left in tank after cleaning.
(5) Steam clean exterior of tank, dry thoroughly and install items removed in steps (1) and (2) above.

c. Installation. Reverse *a* above.

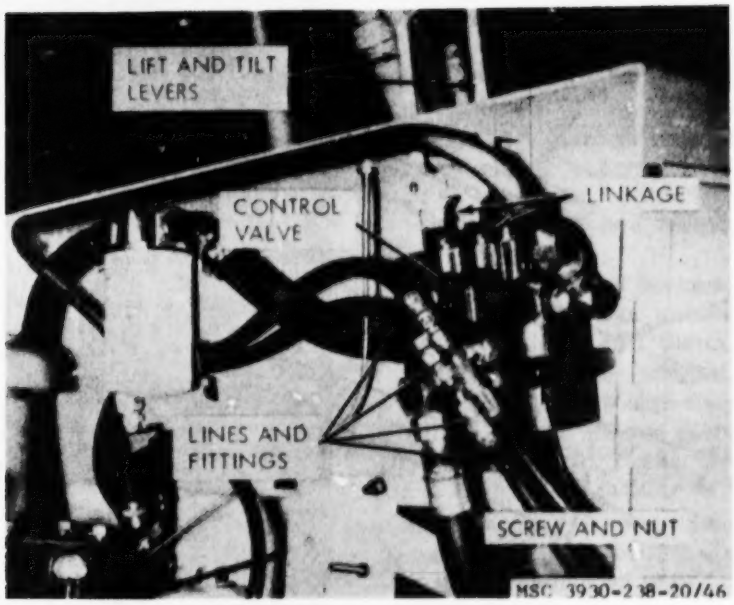


Figure 46. Hydraulic control valve, installed.

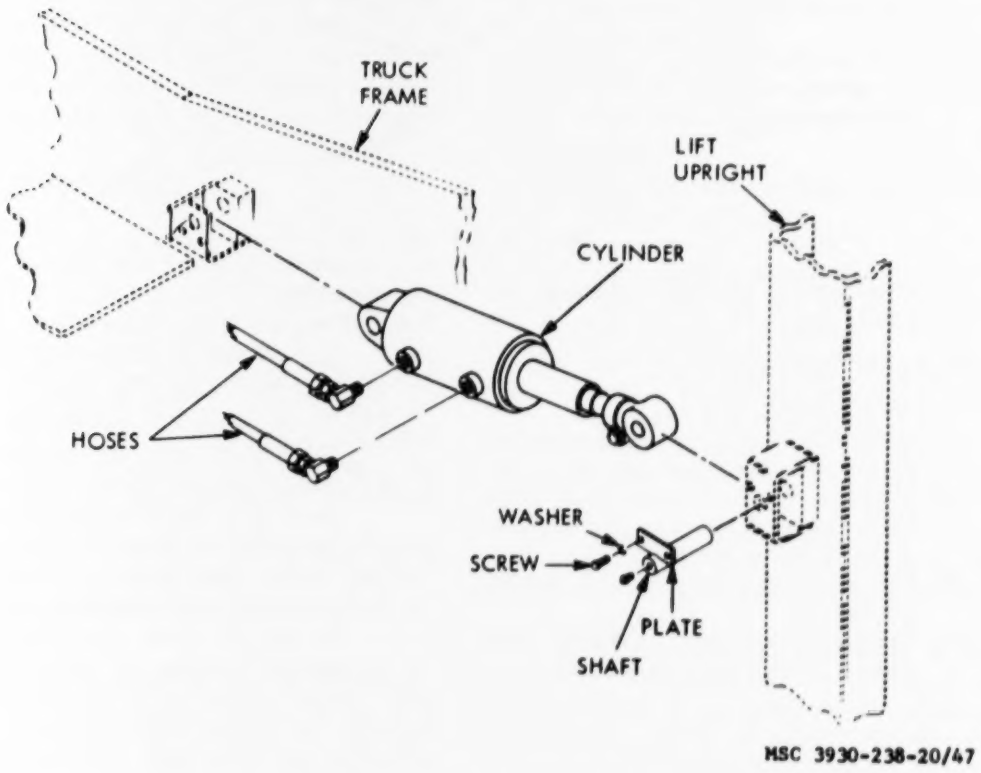


Figure 47. Tilt cylinder removal.

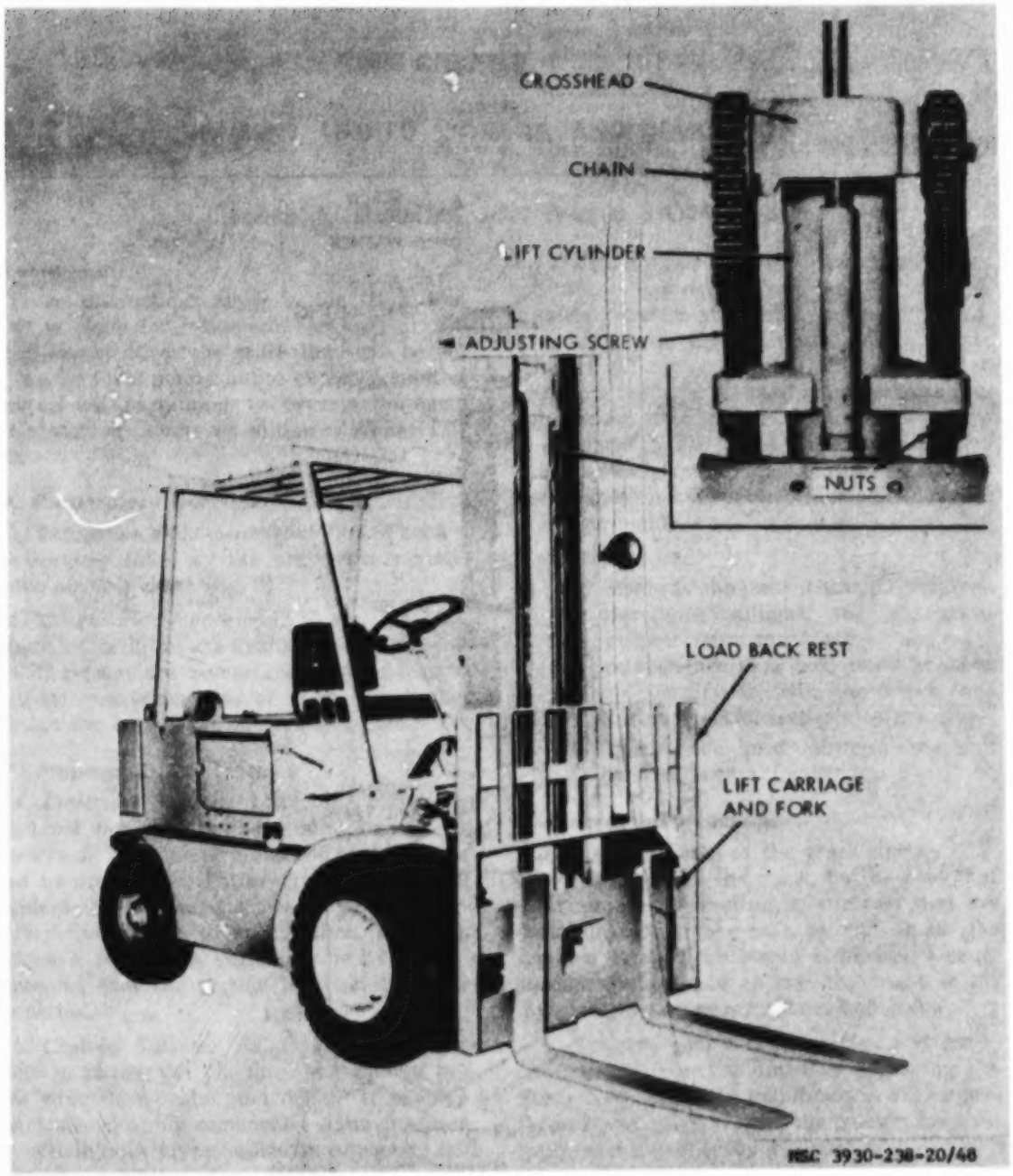


Figure 48. Lift chain removal.

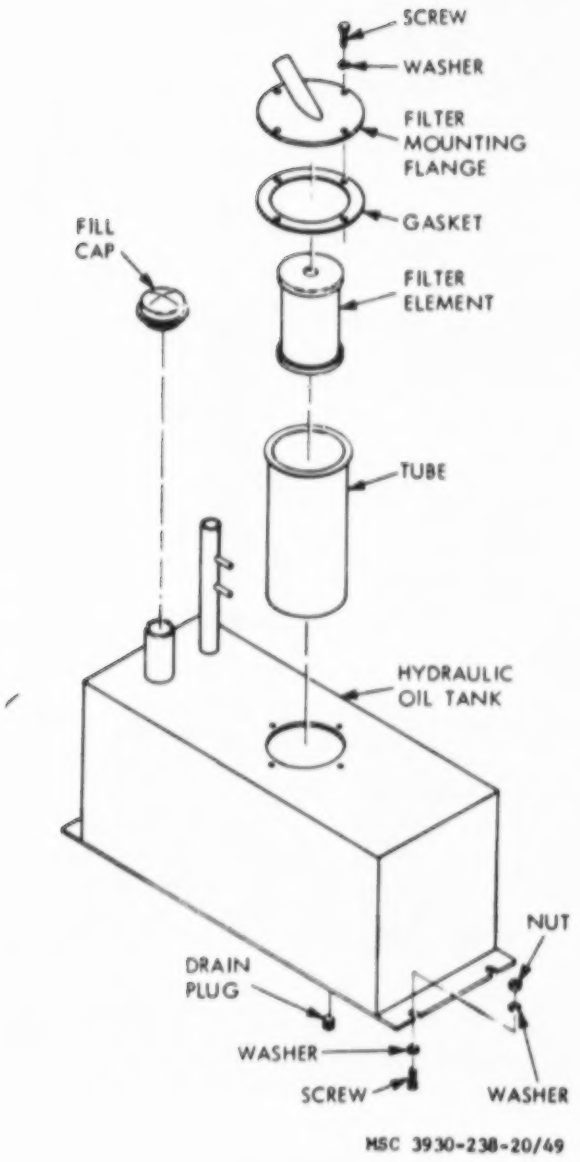


Figure 49. Hydraulic oil tank, exploded view.

CHAPTER 4

SHIPMENT, LIMITED STORAGE, AND DEMOLITION

Section I. SHIPMENT AND LIMITED STORAGE

78. General

These instructions apply to the truck that is to be ready for immediate use upon arrival from shipment, or the truck that will be out of service for a period not to exceed 6 months. Instructions pertaining to oversea shipment are contained in current edition of MIL–STD–162.

79. Preparatory Services

a. Inspection and Operational Test. Perform the services listed in the preventive maintenance services chart (fig. 3).

b. Correcting Deficiencies. Correct all deficiencies if facilities are available for such service. If repairs are beyond the scope of organizational maintenance, refer them to a higher echelon for correction.

80. Preparation of Truck

a. Electrical System. Leave the battery in the truck but be sure the ground lead is disconnected. Tape the terminal end of the ground lead to prevent the battery from discharging accidentally. Use tape, adhesive, pressure-sensitive, conforming to specification PP–T–60. Attach a tag to the steering wheel to advise personnel that the ground lead has been disconnected.

b. Cooling System. Following the instructions in paragraph 53, flush the cooling system with clean water and drain. If rust appears, use cleaning compound. After draining, fill system with proper amounts of coolant and corrosion inhibitor compound.

c. Fuel Tank. Do not drain the fuel from the tank if the truck is to be stored for less than 90 days. If the truck will be stored for a longer period, follow the procedures in current edition of MIL–STD–162 or Specification MIL–E–10062.

d. Cleaning and Painting. Wash the truck and remove any debris from the floor and the engine compartment. Remove rust and corrosion, and scrape any flaked and peeling paint; then dry all surfaces to be painted or coated with preservatives. Repaint as required to protect against deterioration. Painting shall be as specified in TM 9–213. Apply PL-Medium to exposed surfaces susceptible to rust or corrosion and not otherwise protected. Clean all tires thoroughly.

e. Accessories.

(1) Remove the seat cushion, backrest, headlight, taillight, and fire extinguisher from the truck. Place these components in a box, mark the box to identify it with the truck, and fasten the box securely to the truck.

(2) Secure the hood assembly and seal it with tape.

81. Storage Instructions

a. Provide access to the truck during storage. Do not block the truck, but be sure that the tires are not resting on surfaces that are contaminated with grease or oil. Cover the truck if it is to be stored outdoors. During storage, inspect and operate the truck at the intervals in the manner described below.

b. Perform quarterly inspection and maintenance and report findings by preparing DA Form 2404. Required maintenance will be performed promptly to insure the truck is mechanically sound and ready for use.

c. Operate the truck sufficiently to bring it to operating temperature. After operation, represerve for shipment or limited storage.

82. Loading and Blocking on Railroad Cars

a. Loading. Load and unload the truck under its own power, whenever possible, using

permanent ramps or spanning platforms. If the truck cannot operate under its own power, push, tow, or lift it into position. When lifting equipment, be sure to attach hooks, chains, or cables only to places marked LIFT HERE.

b. Clearances. Position the truck on a flatcar so that the flatcar brake handwheel will have proper clearance on all sides, and so that overall car clearance will conform to requirements of the Association of American Railroad rules.

c. Brakes. After the truck is in position on the flatcar, set the handbrake lever and wire down the service brake pedal, or place a block between the brake pedal and the equipment frame to hold the pedal in the applied position.

d. Securing Truck. To secure the truck to flatcar, proceed as follows:

The truck shall be secured on the car as outlined in section 6, figure 54 of AAR Rules Governing the Loading of Commodities on Open Top Cars.

Section II. DEMOLITION

83. General

Do not destroy the truck except on order of proper authority, and demolish it only to prevent capture and use of the truck by the enemy. Destroy the same parts on all similar equipment to prevent enemy use through cannibalization.

84. Methods

a. Controls. Smash all controls, including steering wheel.

b. Gasoline Engine. Pierce or smash cylinder block. Damage crankshaft and camshaft.

c. Transmission and Differential. Pierce or smash transmission and differential case.

d. Steering Gear. Pierce or smash steering gear housing.

e. Wires, Cables, and Lines. Cut, rip out, or otherwise destroy all wires, electrical cables, and fuel, oil, or water lines.

f. Carburetor and Manifolds. Smash these assemblies.

g. Generator, Distributor, Ignition Coil, and Spark Plugs. Destroy these components by smashing.

h. Radiator. Drive large holes through core and tubes.

i. Battery. Break case and plates of battery.

APPENDIX I

REFERENCES

AR 310–1	General Policies.
AR 320–5	Dictionary of United States Army Terms.
AR 320–50	Authorized Abbreviations and Brevity Codes.
AR 600–55	Motor Vehicle Driver-Selection. Testing and Licensing.
AR 700–38	Unsatisfactory Equipment Report.
AR 700–58	Report of Damaged or Improper Shipment.
AR 700–3900–5	Registration of Materials Handling Equipment and Special Purpose Vehicles.
AR 746–2300–1	Color and Marking of Vehicles and Equipment.
AR 750–5	Organization, Policies and Responsibilities for Maintenance Operations.
AR 750–3900–1	Materials Handling Equipment.
AR 754–9130–1	Utilization of Automotive Gasoline.
DA Pam 108–1	Index of Army Motion Pictures, Film Strips, Slides, Tapes, and Phono-Recordings.
DA Pam 310–1	Index of Administrative Publications.
DA Pam 310–2	Index of Blank Forms.
DA Pam 310–3	Index of Training Publications.
DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 4, 6, 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.
FM 21–5	Military Training.
FM 21–6	Techniques of Military Instruction.
FM 21–30	Military Symbols.
TM 10–3930–238–10	Operator's Manual; Truck, Lift, Fork, Gasoline, Pneumatic Tired Wheels, 6,000-Pound Capacity, (Baker Model FJF–060, Army Model MHE 193, Federal Stock Number 3930–738–5938, procured under contract DSA–4–014864.
TM 10–3930–238–20P	Organizational Maintenance Repair Parts and Special Tool Lists; Truck, Lift, Fork, Gasoline, Pneumatic Tired Wheels, 6,000-Pound Capacity, (Baker Model FJF–060, Army Model MHE 193, Federal Stock Number 3930–738–5938, procured under contract DSA–4–014864.
TM 21–300	Driver Selection and Training (Wheeled Vehicles).
TM 38–230	Preservation, Packaging, and Packing of Military Supplies and Equipment.
TM 38–750	Army Equipment Record Procedures.
SM 3–C68P–ML, Vol. 2	Petroleum-Base Chemicals, Chemical Specialties, and Related Materiel, FSC Group 6810 & 6850 Chemicals and Chemical Products.
MIL–STD–162	Preparation for Delivery of Warehouse Materials Handling Equipment for Domestic and Oversea Shipment and Storage.
LO 10–3930–238–20	Lubrication Order; Truck, Lift, Fork, Gasoline, Pneumatic-Tired Wheels, 6,000-Pound Capacity (Baker Model FJF-060, Army Model MHE 193), FSN 3930–738–5938.

APPENDIX II

MAINTENANCE ALLOCATION CHART

1. This appendix was prepared and lists all maintenance operations to be performed by the applicable echelons. These allocations are based on skills, tools, test equipment and the time required or available in the average TOE organization.

2. The sequence of entries coincides with the sequence followed in the repair parts and special tools list in TM 10–3930–238–20P.

3. The explanations listed below define the terms used in this maintenance allocation chart:

a. Clean. To perform major cleaning internally or with disassembly.

b. Adjust. To regulate periodically to prevent malfunctioning.

c. Inspect. To verify serviceability and to detect electrical or mechanical failure by scrutiny.

d. Test. To verify serviceability and to detect electrical or mechanical failure by use of special equipment such as gages, meters, etc.

e. Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

f. Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to, inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

g. Align. To adjust two or more parts and/or assembles of an electrical precision, mechanical, or steering system so that their functions are properly synchronized.

h. Overhaul. To restore an item to a completely serviceable condition as prescribed by serviceability standards. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul operation.

Maintenance Allocation Chart

Group No.	Component and related operations	Maintenance echelons 1	2	3	4	5	Tools required	Remarks
01	ENGINE							
0100	Engine asembly							
	Test		X					Compression, vacuum, timing.
	Replace			X				
	Overhaul				X			
0101	Crankcase, block, cylinder head							
	Inspect				X			
	Overhaul (rebore)					X		Reboring may be accomplished at 4th echelon if facilities are available from Government or commercial sources.
	Head, cylinder							
	Clean, inspect, replace		X					
	Repair			X				
	Repair							

Group No.	Component and related operations	Maintenance echelons 1	2	3	4	5	Tools required	Remarks
0105	Valves, intake and exhaust							
	Adjust	.....	X					
	Replace, repair	.....	.....	X				
0106	Filter, engine, oil							
	Clean, replace	.....	X					
0108	Manifold, intake and exhaust							
	Clean, inspect, replace	.....	X					
03	FUEL SYSTEM							
0301	Carburetor							
	Adjust, replace	.....	X					
0302	Pump, fuel							
	Clean, test, replace	.....	X					
0304	Air cleaner							
	Clean, replace	.....	X					
0306	Tank, fuel							
	Clean, replace	.....	X					
	Repair	.....	.....	.....	X			
0308	Engine speed governor and controls							
	Adjust, replace	.....	X					
0312	Accelerator, throttle or choke controls							
	Adjust, replace	.....	X					
04	EXHAUST SYSTEM							
0401	Muffler and pipes							
	Inspect, replace	.....	X					
05	COOLING SYSTEM							
0501	Radiator							
	Clean, replace	.....	X					
	Test, repair	.....	.....	.....	X			
0503	Thermostat							
	Test, replace	.....	X					
0504	Water pump							
	Inspect, replace	.....	X					
0505	Fan assembly							
	Belt, V							
	Adjust, replace	.....	X					
06	ELECTRICAL SYSTEM							
0601	Generator							
	Replace	.....	X					
	Repair	.....	.....	X				
0602	Generator regulator							
	Test, replace	.....	X					
0603	Starting motor							
	Replace	.....	X					
	Repair	.....	.....	X				
0605	Distributor							
	Adjust, replace, repair	.....	X					
	Coil, spark plugs, capacitor							
	Clean, adjust, test, replace	.....	X					
0607	Gages, instruments							
	Inspect, replace	.....	X					
0612	Battery and cables							
	Clean, test, replace	.....	X					
0613	Hull or chassis wiring harness							
	Replace	.....	.....	X				
	Repair	.....	X					
07	TRANSMISSION							
0710	Transmission assembly							
	Test, replace	.....	.....	X				
	Overhaul	.....	.....	.....	X			

Maintenance Allocation Chart—Continued

Group No.	Component and related operations	Maintenance echelons 1	2	3	4	5	Tools required	Remarks
09	PROPELLER AND PROPELLER SHAFTS							
0900	Propeller shafts							
	Replace, repair			X				
10	FRONT AXLE							
1000	Front axle assembly							
	Inspect, replace			X				
	Repair				X			
11	REAR AXLE							
1104	Axle assembly, steering							
	Adjust, replace, repair			X				
12	BRAKES							
1201	Hand brakes							
	Lever, linkage, drum							
	Adjust, replace			X				
1201	Shoes, brake							
	Adjust, replace		X					
	Repair			X				
1202	Service brakes							
	Brake shoes							
	Adjust, replace, repair			X				
1204	Cylinder assembly, master							
	Replace		X					
	Repair			X				
	Cylinder assembly, wheel							
	Replace		X					
	Repair			X				
1206	Mechanical brake system							
	Pedal, linkage							
	Adjust, replace		X					
	Repair			X				
13	WHEELS							
1311	Wheel assembly							
	Hub, seals, drums, wheels							
	Replace		X					
	Repair				X			
	Bearings							
	Clean, adjust, replace			X				
1313	Tires, tubes							
	Replace, repair		X					
14	STEERING							
1401	Gear assembly							
	Adjust, replace			X				
	Repair				X			
1401	Drag link							
	Adjust, replace, repair		X					
1412	Cylinder assembly, steering							
	Adjust, replace		X					
	Test, repair			X				
18	BODY							
1806	Upholstery seats							
	Replace		X					
	Repair				X			
24	HYDRAULIC LIFT COMPONENTS							
2401	Hydraulic pump							
	Test, replace, repair			X				
2402	Hydraulic control valve							
	Replace, repair			X				
2403	Hydraulic control levers and linkage							
	Inspect		X					

Maintenance Allocation Chart—Continued

Group No.	Component and related operations	Maintenance echelons 1	2	3	4	5	Tools required	Remarks
	Replace	.....	.....	X				
2404	Hydraulic tilt cylinders							
	Adjust, replace	.....	X					
	Repair	.....	.....	X				
2405	Cylinder, lift							
	Replace, repair	.....	.....	X				
	Mast assembly							
	Replace, repair	.....	.....	X				
	Carriage assembly							
	Replace, repair	.....	.....	X				
	Chain, hydraulic lift							
	Clean, inspect, adjust, replace	.....	X					
2406	Tank assembly, hydraulic oil							
	Clean, replace	.....	X					

APPENDIX III

REPAIR PARTS AND SPECIAL TOOL LISTS

A list of repair parts and special tools authorized for organizational maintenance is published under separate cover (TM 10–3930–238–20P).

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NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320–50.

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